AMERICAN GAS ASSOCIATION MONTHLY

Vol. V No. 4

APRIL, 1923

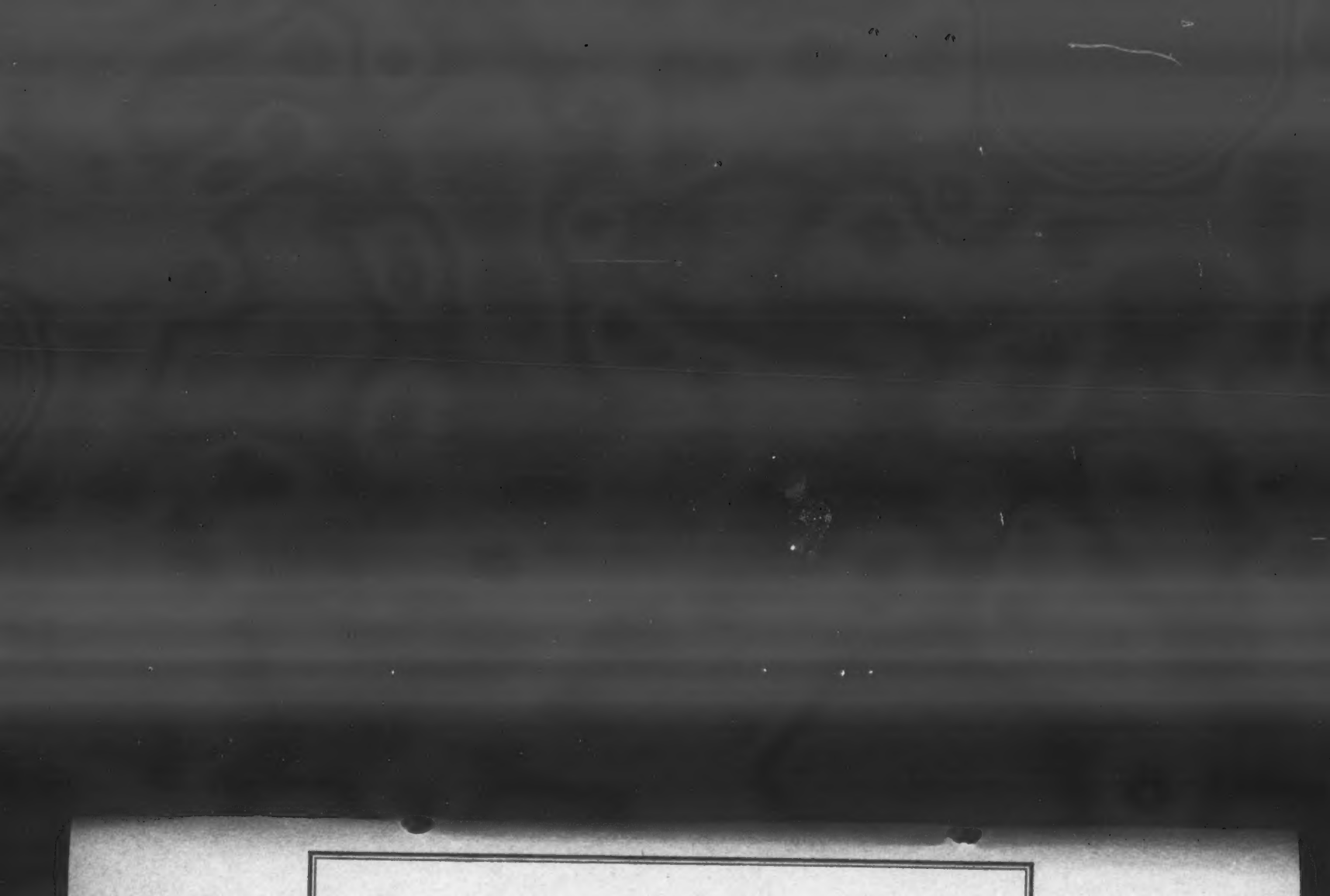
SOME say there is no "romance" in the gas business. To such we need only show the colossal growth of the industry from its meager beginnings to a position where it serves millions of people. We need only call to mind the strong men who have guided its development and have served the nation and the state as well as their own particular business. If we study it, if we realize its destiny, the gas industry spells "romance."

Wanted: Proceedings of the American Gas Light Association

Mr. Edward L. Rieha, 1601-1602 Lexington Building, Baltimore, Md., would like any member who has spare volumes of the Proceedings of the American Gas Light Association for the years 1892, 1893, 1894 and 1895 to communicate with him.

Wanted: 1920 A. G. A. Technical Proceedings

A copy of the 1920 Technical Section Proceedings of the A. G. A. are wanted to complete the file in The Engineering Societies' Library. Association headquarters will be glad to purchase the needed copy from any member who can spare it. Kindly notify these headquarters if you have an extra copy which we can obtain.



C O N T E N T S

VOLUME V APRIL, 1923 NUMBER 4

Accounting Section Notes 226
Advertise the Slogan 217
A. G. A. Specifications Should Be Your Specifications 239
Art of Conciliation, The 207
Associations Affiliated with the A. G. A. 238
Atlantic City, 1923 206
Bulletin 133, Engineering Experiment Station, University of Illinois 254
Capacities of Consumers' Meters 255
Correction Service Letter No. 40 238
Cotton Yarn Singeing 245
Don't Miss this Opportunity 234
Eastern States Gas Conference 218
Efficient Method for Heating Cleaning Tanks 244
Employment Bureau 256
For Those Companies Interested in Outdoor Gas Lighting 242
Gas Sales Bulletin for April, May and June 243
Growing Fast 237
In Memoriam—Frank J. Baker, John Doyle, Roy M. Buell 220
Lessons Learned in A Slogan Contest 232
Magazine Publicity 225
Making the Easter Bonnet 247
Members! 213
Mother Goose Up-to-Date 246
National Organization, A, Editorial 194
Nebraska's Unique Educational Work 234
New Members 220
Peak Send Out Figures, 1923 228
Prizes for the Companies Making the Best Records of Appliance Sales Per Meter 241
Remarkable Year Book, A 237
Report II of the Commission on Resuscitation from Gas Poisoning by Manufactured Gas 195
Self Corrosion of Buried Lead Pipes, The 228
Southwestern Public Service Association Meeting 225
Standardization From the Consumer's Point of View 214
Sulphur Compounds Other Than Hydrogen Sulphide in Gas as a Factor Governing the Selection of Gas Coals 251
Technologic Paper No. 222, Bureau of Standards 254
Trials and Tribulations 250
Utica Goes After Good Will 239
What Some Companies Are Doing to Gain the Customers' Good Will 221

AUTHORS

Cannon, Walter B., M. D. "Report II of the Commission on Resuscitation from Poisoning by Manufactured Gas" 195
Drinker, Cecil K., M. D.
Craven, J. B. "Sulphur Compounds Other Than Hydrogen Sulphide in Gas as a Factor Governing the Selection of Gas Coals" 251
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Harriman, N. F. "Standardization From the Consumer's Point of View" 214
Stoecker, Louis. "What Some Companies Are Doing to Gain the Customers' Good Will" 221

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American Gas Association Monthly

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A National Organization

A national organization. What does that mean? Just what is it that makes it national?

A complex question, the answer to which demands the consideration of many phases.

The membership must represent the North, South, East and West. The directing body of the organization must carry representatives from these four points of the compass. And these same memberships, individual and directorate, must embrace every different phase of work directly or indirectly a part of the industry which the organization represents. Its membership must include the majority of this industry. Its committees must cover all branches of the work of the industry and their personnel must be geographically national. The work of the organization must be as broad as the term national is intended to convey.

These, in short, are the evident things which make any organization national.

But there is at least one other phase, not so evident, not so often considered, but equally vital.

An organization may have all but this one and yet not truly be national in the strongest meaning of that term. It is an intangible thing, which, for a better term, we might describe as "a national spirit of work and cooperation and service." It should closely approach the spirit of patriotism. Unless the organization possesses this, too, it has not fully realized the full meaning of "national."

And in this we are thankful to say, our Association does qualify.

It would indeed be self-evident to anyone who had the good fortune to attend the recent Board and Committee meetings held in Chicago. Held away from Association headquarters, ninety-five men traveled from afar to meet in one place to give their time and services to the Association.

It is such a national spirit which must be present before any organization can hope to be a truly national one.

AMERICAN
GAS ASSOCIATION
MONTHLY

Vol. V APRIL, 1923 No. 4

Report II of the Commission* on Resuscitation from Poisoning by Manufactured Gas

CECIL K. DRINKER, M.D., and WALTER B. CANNON, M.D.

This report has not yet been presented to the Executive Board for official action. It is being published at present in accordance with the Association's policy to put subjects of interest before its membership for the purpose of inviting discussion. (EDITOR'S NOTE.)

THE PROBLEM of resuscitation from poisoning by manufactured gas possesses far greater complexity than is offered in the case of resuscitation either from drowning or from electric shock. In these latter cases, as Henderson and Haggard (1) have pointed out in the first report of this Commission, the patient is practically saved when respiration has been restored. There is little or no question of effects which may express themselves hours or even days afterwards. Furthermore, these two common types of accident are essentially acute. In drowning, for example, the heart may be experiencing the effects of acute asphyxia at the moment when artificial respiration is started, but it has not been subjected to a prolonged period of gradually developing oxygen lack, as

*Personnel of the Commission: Cecil K. Drinker, M. D., Associate Professor of Applied Physiology, Harvard Medical School, Chairman; Walter B. Cannon, M. D., Professor of Physiology, Harvard Medical School; David L. Edsall, M. D., Dean of the Harvard Medical School, and Professor of Clinical Medicine, Harvard Medical School; Howard W. Haggard, M. D., Instructor in Applied Physiology, Yale University; Lawrence J. Henderson, M. D., Professor of Biological Chemistry, Harvard Medical School; Yandell Henderson, Ph.D., Professor of Applied Physiology, Yale University; Francis W. Peabody, M. D., Professor of Medicine, Harvard Medical School; Royd R. Sayers, M. D., Chief Surgeon, United States Bureau of Mines, Washington, D. C.; and Charles B. Scott, Bureau of Safety, American Gas Association.

may readily be the case in gas poisoning. Another important element in this latter type of poisoning is found in the fact that gassed patients may pass through a prolonged period of unconsciousness both before and after natural respiration has been restored. While in drowning there is, of course, aspiration of water into the air passages, the water which is not emptied out during the measures utilized for resuscitation is usually absorbed rapidly and causes no damage. In gas asphyxia, on the other hand, there is considerable evidence of the existence of pulmonary congestion and of overproduction of fluid in the lungs and the bronchial tree, and the presence of this fluid must be kept in mind when one considers the best sort of artificial respiration to employ.

Before making an actual examination of artificial respiration, the authors have felt it wise, first, to obtain knowledge of the current practice in resuscitation in the gas-producing industry of the country and, secondly, to examine more thoroughly than has been done in the past the clinical course of gassed patients who have received hospital treatment.

Section I. Present Practice in Resuscitation from Poisoning by Illuminating Gas

After communicating with Mr. Oscar H. Fogg, Secretary-Manager of the American Gas Association, we sent to a group of seventeen large gas producers an explanatory letter and the following questionnaire:

1. What is your present organization for dealing with gassed cases?
2. How have the individuals in charge of this work been trained?
3. Do you issue any general instructions to foreman, etc., relative to artificial respiration?
4. What equipment do you provide for your resuscitation team? Why has this equipment been chosen?
5. If possible, forward records of all cases treated for gas poisoning by agents of your company during the past five years. It is important that these records include notes as to whether the patient was breathing when treatment began; how long the treatment continued; any details available as to the immediate and future condition of patients who recovered.
6. Forward any comments upon the resuscitation problem which have not been covered by the preceding questions and which you believe may be of service to the committee.

The following firms received this request for information:

1. The Consolidated Gas Electric Light and Power Company of Baltimore
2. The Boston Consolidated Gas Company
3. The Brooklyn Union Gas Company
4. The Peoples Gas Light and Coke Company of Chicago
5. The Denver Gas and Electric Light Company
6. The Detroit City Gas Company
7. The Georgia Railway and Power Company
8. The Southern California Gas Company
9. The Milwaukee Gas Light Company
10. The New Haven Gas Light Company
11. The Providence Gas Company
12. The Public Service Gas Company of Newark
13. The Consolidated Gas Company of New York
14. The United Gas Improvement Company of Philadelphia
15. Portland Gas and Coke Company
16. The Rochester Gas and Electric Corporation
17. The Laclede Gas Light Company of St. Louis

These widely scattered organizations may be considered to represent the ex-

perience of gas producers in this country. All except one replied, and usually in great detail.

In summarizing the answers received, it is possible to treat the questions together. In all cases, one is impressed by the effort that has been made to place resuscitation upon a practical basis. In most instances this work is allotted to carefully trained rescue crews on duty in shifts so that all calls can receive immediate attention. Occasionally larger groups of responsible employees, headed by a superintendent and extending down through sub-foremen, have received first-aid instruction, the size of the group ensuring the availability at all times of someone competent to render assistance.

If, now, we systematize the information received in regard to the method of resuscitation actually used, we find that in all cases the Schäfer, or prone pressure, method of artificial respiration is taught. Whether or not the chief reliance is placed upon this method is another matter. Table I summarizes the situation existing prior to the publication of the work of the present Commission.

Prone Pressure Group

Seven out of sixteen firms rely upon manual methods to the exclusion of apparatus. The statements made are of interest:

Chicago—"The only equipment provided is an oxygen tank to use with the artificial respiration in case it is needed. This practice has been established because a study of the pulmotor reports used by this office prior to 1915 did not show satisfactory results."

Atlanta—"We have a pulmotor but have discarded use of this. We use the prone pressure method."

Newark—"The Public Service Gas Company has become satisfield that the Prone Pressure Method of Resuscitation is superior to any requiring mechanical appliances."

Portland—"We have used the pulmotor in a limited number of cases but our experience has not been sufficient to arrive at any definite opinion as to its merits or demerits. We are inclined to believe, however, judging from our ex-

TABLE I

Summary of the Immediate Method of Resuscitation employed by a Group of Representative Gas Producers in the United States

Prone Pressure Method (No Apparatus used)	Lungmotor	Pulmotor
1. The Peoples Gas Light and Coke Company of Chicago	1. The Denver Gas and Electric Light Company	1. The Consolidated Gas Electric Light and Power Company of Baltimore
2. The Georgia Railway and Power Company	2. The Detroit City Gas Company	2. The Boston Consolidated Gas Company
3. The Milwaukee Gas Light Company[1]	3. The New Haven Gas Light Company	3. The Brooklyn Union Gas Company
4. The Public Service Gas Company of Newark		4. The Denver Gas and Electric Light Company
5. The Portland Gas and Coke Company		5. The New Haven Gas Light Company
6. The Laclede Gas Light Company of St. Louis		6. The Providence Gas Company
7. The Southern California Gas Company[2]		7. The Consolidated Gas Company of New York
		8. The United Gas Improvement Company of Philadelphia

[1]Owns both lungmotor and pulmotor but has never used them.
[2]Possesses pulmotor but has never used it.

perience, that the Prone method of resuscitation is superior to the use of the pulmotor or other similar appliances on the market."

St. Louis—"We formerly had a number of lungmotors, and still have them but are not using them. We have discarded their use due to the delay which usually follows in the lungmotor reaching the scene of the accident promptly, and which is so essential to rescue work. We are thoroughly convinced the Prone Pressure Method of resuscitation is the best method, for the reason fellow workmen can, without any delay, or without waiting for mechanical equipment, immediately start to work on the victim. The use of mechanical equipment requires a trained operator, and also requires the equipment itself be kept in a 100 per cent condition at all times, and we are advocating the use of the Prone Pressure Method in cases of electric shock, as well as gassed cases."

Milwaukee—"This company does not maintain a rescue squad though we do own and keep at convenient locations two pulmotors and three lungmotors. We, however, have never used any one of these machines in the several years that they have been in our possession . . . There is so much conflicting testimony that we have been very loath to put the equipment into use on our own responsibility."

Lungmotor Group

Denver—"In all our plants, general office, and in the safety department, we have both the pulmotor and lungmotor, oxygen tanks, and special breathing devices. Our men are instructed to never use them except as a *last resort*. Our teams and men have been taught the prone pressure method and I fully believe that if this method fails to revive a patient, all the artificial devices will be of no avail. I have no faith in the lungmotor or pulmotor, but for the moral effect I feel that it is wise to have them."

Detroit—"The Detroit City Gas Company makes use of rescue crews, the members of which are trained in the company's school of instruction in the mechanical handling of gassed cases and in the providing of proper ventilation, etc.; also, in the use of the Schäfer method of artificial respiration, the use of the lungmotor and its accessories, in the administration of stimulants, and in diagnosing the effects of treatments administered. . . . We believe that the lungmotor is very efficient as a means of resuscitation. Over a period of two years, not a single case has been lost where life was found to exist when we took charge of the subject."

Beginning in January, 1921, this company has kept a record of the cases of gas poisoning which it has cared for. The list consists of fifty-six cases. Table 2 indicates the character of the respiration in these patients when relief measures were instituted. In two cases character of breathing was not given. Of the cases not breathing when first seen, all three were pronounced dead by a physician either immediately or within thirty minutes.

Table II

Character of Respiration in Fifty-four cases of Gas Poisoning when found by Relief Crew Crews of the Detroit City Gas Company

Not Breathing	Slight or Difficult Breathing	Excessive Breathing	Normal Breathing
3	14	21	16

Table III

Character of Treatment in Fifty-four cases of Gas Poisoning reported by Detroit City Gas Company

Not Breathing	Slight or Difficult Breathing	Excessive Breathing	Normal Breathing
3	14	21	16
Lungmotor in 2	Lungmotor in 13. Oxygen inhalations in 1.	Lungmotor in 4. Oxygen inhalations in 17.	Lungmotor in 2. Oxygen inhalations in 14.

Table 3 shows at a glance the treatment given under the varied conditions of respiration which existed when the patients were first seen. If gassed patients are not breathing, they are dead or very nearly so, and the wisdom of rely-

ing upon the prone pressure method of artificial respiration without the necessity of waiting for instruments is at once apparent. The gassed patient who has stopped breathing is in even worse condition than the patient suffering from electric shock, since he has been subjected to a considerable period of anoxemia prior to actual cessation of respiration, and his heart is in no condition to stand further strain. Table 3, however, brings out the fact that most patients poisoned by manufactured gas are breathing when first seen. No patient who breathes naturally needs or should be given artificial respiration either by apparatus or manually. Apparatus is likely to oppose the natural movements rather than to assist them, which is not the case with the manual method. But even this method is contraindicated when the subject is breathing spontaneously. The object to be aimed at is the displacement of carbon monoxide from the blood through the mass action of increased oxygen concentration in the lungs.

The wisdom of the oxygen carbon-dioxide inhalations recommended by Henderson and Haggard in the first report of the committee is more than ever clear. The best chance for recovery of the fourteen patients breathing slightly or with difficulty is in natural or in rather deep breathing, with opportunity to get plenty of oxygen. Such a situation is provided with greater certainty by means of oxygen carbon-dioxide inhalations than by any measures entailing positive pressure ventilation.

A final point of interest is found in the number of patients who were breathing either excessively or naturally. These are cases of early or slight poisoning, yet, it will be seen that the lungmotor has been used in six of them, a procedure which has no logical justification. The existence of a period of excessive breathing is an interesting confirmation of the experiments of Henderson and Haggard presented in the first report of the Commission.

In twenty-one of the fifty-six Detroit cases the patients were unconscious when first seen, and certain of them were sent to hospitals. In four cases the breathing is described as *hard*, which means obstructed. All of these points are of importance to us. The unconscious patient, even though he may be able to breathe normally, is less able than is the conscious individual to protect himself against the possibility that mucus, saliva, vomitus, or blood may pass down the trachea and into the lungs. The frequency of pulmonary complications in gassed cases forms the second part of this report and the possible relation of positive ventilation to such complications is discussed.

New Haven—The New Haven Gas Light Company instructs a fairly large group of employees in the prone pressure method of resuscitation and also possesses both a pulmotor and a lungmotor. In regard to the condition of gassed cases when first seen, the following statement is made: "During twelve years' active service with gangs of men engaged in laying gas mains and services, there have been probably only five or six cases where the patient did not recover consciousness in less than five minutes. The largest number of cases (numbering possibly two hundred) have returned to consciousness in from one to three minutes. My understanding of this fact is that the patient has been more suffocated by the absence of oxygen than poisoned by the carbon monoxide of the manufactured gas, and as soon as removed from a gaseous atmosphere, if respiration had not been entirely sus-

pended, natural breathing was sufficient to return the patient to normal condition."

The reasons given for utilization of the pulmotor and the lungmotor are: "The pulmotor was chosen because it provided an apparatus to use in extreme cases where respiration had practically been suspended, that would draw out of the lungs what air or gas was in them and would put into the lungs air that had been enriched with additional oxygen. It seemed to function under a pressure that (to the layman at least) was not great enough to destroy the lung tissues. Later when the lungmotor was developed, it was purchased as an additional equipment, that probably was better than the pulmotor on the ground that the quantity put into and taken out of the lungs could be increased or decreased (within reasonable limits) to suit the lungs of the patient."

The Pulmotor Group

Eight firms possess and use the pulmotor. Upon reading their experiences with the instrument, one obtains the impression that the original purchases were made some time ago when the mechanical ingenuity of the apparatus, coupled with a most effective advertising campaign, seem to have recommended the pulmotor very widely; and that its use at the present time depends largely upon the demand of the public for the instrument—a demand which, in turn, is fostered by the willingness of the press to print any item of news to which the word *pulmotor* is attached. None of the material received contained data demonstrating an efficiency for the pulmotor unattainable by the simple manual method of artificial respiration. The following statement will serve to summarize the general attitude of pulmotor users toward the subject.

Philadelphia—"We consider the Schäfer Manual Prone Pressure Method as now taught superior to any method involving mechanical apparatus, but have not had any experience to indicate that the later should be entirely done away with."

Summary of Section I

The first section of the report may be summarized as follows:—

1. Gas companies throughout the country are making earnest endeavor to provide the best means of resuscitation known to them.

2. Seven firms employ the Schäfer prone pressure method alone. Three employ the lungmotor and eight the pulmotor (two of these firms using both instruments). Of those using the prone pressure method, three have discarded mechanical devices for artificial respiration.

3. The experience of the Detroit City Gas Company indicates that in most cases of gas poisoning the patients are breathing when first seen and that a large percentage are unconscious.

4. These facts indicate the utility of the oxygen carbon-dioxide inhalations recommended by Henderson and Haggard in the first report of the Commission. This method of treatment induces deeper breathing and avoids the possibility of forcing fluid into the lungs and so giving a basis for a possible bronchopneumonia. Inhalation of oxygen alone has rather wide employment among the gas companies and can be commended.

5. The fact, as indicated by the Detroit City Gas Company records, that the most severely gassed patients are usually taken to a hospital indicates the necessity for an examination of hospital records in order to get data upon the final outcome of gassing and, in particular, upon the frequency of pulmonary complications—a point which bears upon

the type of artificial respiration to be advised.

SECTION II. THE EVENTUAL COURSE OF PATIENTS POISONED BY MANUFACTURED GAS

Seriously gassed patients do not present immediate problems in regard to resuscitation when they finally arrive at a hospital. At this time they have practically always begun to breathe, and they are brought in for care during recovery from a severe experience. It happens, however, that the subsequent course of such cases has a possible relation to the type of resuscitative treatment applied by rescue squads when the patients are first seen.

The literature upon gas poisoning contains many references to pneumonia as a sequel, and to the existence of râles in the chest and of pulmonary edema as immediate accompaniments of severe gassing and especially of gassing which has occurred slowly. There are, however, no statistical data upon the frequency with which excess moisture is found in the respiratory passages and deep in the lungs of patients poisoned by gas. If it should prove to be the case that gas poisoning is frequently accompanied by moisture in the respiratory passages, the evidence might have direct bearing upon the type of artificial respiration to be employed when the patients are first seen. An examination of the literature has not disclosed experiments upon the question whether positive ventilation can force infected material down the trachea and into the depths of the lungs. If this should be the case, and it is a subject for experimentation by the Commission at the present time, the bearing upon the use of apparatus such as the pulmotor and lungmotor is obvious. Both of these instruments drive air into the lungs and whether they operate with a sufficient degree of force to carry infected material into the alveoli to form eventual patches of bronchopneumonia, merits investigation.

Examination of the literature discloses the fact that cardiac failure and particularly failure of the right side of the heart, accompanied by pulmonary edema, is frequently the cause of death or of serious danger in gassed patients. If apparatus for artificial respiration is used which is capable of increasing intrapulmonic air pressure to an inordinate degree, it may well be possible at the height of the inspiratory stroke to compress the alveolar capillaries and thus raise the blood pressure in the pulmonary circulation. The unfortunate effect of such a situation upon a right ventricle already in a precarious condition is obvious. Fortunately, this objection to positive ventilation in gas poisoning is one which can be answered by experimentation upon animals, and animal experiments in which are utilized familiar types of artificial respiration apparatus, such as the lungmotor and the pulmotor, are, therefore, being undertaken and will be made public in a later report.

The literature upon gas poisoning lacks statistical data upon the frequency of bronchopneumonia as a sequel and upon the existence of lung findings in general. Believing the best source of such data to be hospital records, we have made an examination of the records of gassed patients in nine hospitals in Boston, New York, and Philadelphia. The total number of cases covered in this investigation is 860. The distribution, together with the years covered, is given in Table 4.

Table IV

Cases of Gas Poisoning in Boston, Philadelphia, and New York

	1906-1909 1918-1921	1908-1921	1904-1917 1922	Percentage			Summary
	Boston	Philadelphia	New York City	Boston	Philadelphia	New York City	Boston, New York and Philadelphia
				%	%	%	%
Total number of cases	235	220	405	—	—	—	—
Average age on admission	41	39	39	—	—	—	—
Deaths	32	26	67	13.6	11.8	16.5	14.5
Number unconscious	143	142	229	60.4	64.6	56.5	59.8
Number frothing at the mouth	14	13	28	6.0	5.9	6.9	6.4
Number respiration 26 or below	54	117	224	43.2	59.1	57.9	55.6
Number respiration above 26	71	81	163	56.8	40.9	42.1	44.4
Average pulse on admission	108	102	104	—	—	—	—
Average temperature on admission	98.4°	98.4°	99.1°	—	—	—	—
Average last temperature recorded before death	—	104.4°	103.6°	—	—	—	—
Lung findings:							
Rales	45	24	73	19.1	13.6	18.0	17.4
Edema	8	12	17	3.4	6.8	4.2	4.5
Pneumonia	7	7	34	3.0	4.0	8.4	5.9
Total with abnormal moisture in respiratory tract	60	43	124	25.5	24.4	30.6	27.8
Abscess	—	1	—	—	—	—	—

The data from the three cities were gathered by different individuals and the points covered were kept as simple as possible. The hospitals providing the material were:

Boston—Boston City Hospital
New York—Bellevue Hospital
Philadelphia—Pennsylvania Hospital
University Hospital
Episcopal Hospital
Presbyterian Hospital
Hahnemann Hospital
Jefferson Hospital
Polyclinic Hospital

To anyone accustomed to the elaborate records now available in our better hospitals upon such subjects as chronic cardiac or renal disease, the brief and inconclusive statements which characterize the hospital records of gas poisoning come as something of a shock. Occasionally full notes are found, but ordinarily the patient recovers or dies without arousing significant interest. That gas poisoning in man may be a profitable field for medical investigation does not seem to have been considered, and this in hospitals where less common and less dangerous diseases are receiving large amounts of study and attention. On account of the meager records available, we have confined our final analyses to a small number of the most pertinent items. A brief inspection of Table 4 will serve to show that the items chosen do not, in the main, require great subtlety of diagnosis or great effort in recording. Where pneumonia has occurred, there has usually been a lapse of several days following admission to the hospital. The records improve in such cases and follow the usual trend that one expects in the description of an acute infection.

The facts presented in Table 4 are strikingly uniform and bear upon the immediate problem of resuscitation in the following items:

1. 59.8 per cent of the gassed patients were unconscious on admission to the hospital or were reported as unconscious when found.

2. 44.4 per cent were breathing rapidly. Only in rare cases was the breathing very slow.

3. The admission pulse rate was high, averaging 104 for the entire series of cases.

4. The records show an average of 6.4 per cent of patients frothing at the mouth; 17.4 per cent with râles in the lungs; and 4.5 per cent with pulmonary edema.

These findings were undoubtedly present in very large part when the patients were first picked up by rescue squads. It thus becomes at once apparent that resuscitative measures in gas poisoning must, in large measure, be applied to unconscious patients who are breathing rapidly, who have rapid hearts, and who, in a large percentage of cases, have excess fluid in the respiratory tract. We have already commented upon the possible dangers of positive ventilation of the lungs in conditions such as these figures show to be very frequent in gas poisoning.

It will be noted that the percentage of pneumonias following gas poisoning is not high. The fact that fatal cases almost invariably show a rise in temperature makes it seem probable to us that some degree of bronchopneumonia must be present in nearly all patients who do not succumb immediately following their exposure to gas. The pneumonia in such instances is probably only a contributory cause of death, fatality being due, in the main, to cardiac and central vasomotor failure. Our table, therefore, tells the story of the severe and unmistakable pneumonia alone. Only by careful an-

Table V

Cases of Gas Poisoning in Boston, Philadelphia, and New York: Unconscious Patients Only

		1906–1909 1918–1921	1908–1921	1904–1917 1922	Percentage			Summary
		Boston	Philadelphia	New York City	Boston	Philadelphia	New York City	Boston, Philadelphia, and New York City
Total number of cases		143	142	229	—	—	—	514 total cases
Deaths		29	25	62	20.3	17.6	27.1	22.6%
Frothing at mouth		13	10	26	9.1	7.0	11.4	9.5%
Respiration on admission	26 or below	30	70	100	35.7	53.0	46.5	46.4%
	above 26	54	62	115	64.3	47.0	53.5	53.6%
	av. per min.	30	27	28	—	—	—	28 av. per min.
Pulse on admission	below 100	18	54	53	21.2	41.5	26.2	30.0%
	100-120	49	55	109	57.6	42.3	54.0	51.1%
	above 120	18	21	40	21.2	16.2	19.8	18.9%
	av. per min.	110	103	107	—	—	—	107 av. per min.
Temperature on admission	below 97	14°	21°	42°	16.3	15.8	18.9	17.5%
	97 -99	48°	72°	75°	55.8	54.1	33.8	44.2%
	above 99	24°	40°	105°	27.9	30.1	47.3	38.3%
	av.	98.2°	98.4°	98.9°	—	—	—	—
Lung findings	Râles	30	18	52	21.0	15.7	22.7	20.5%
	Edema	8	12	15	5.6	10.4	6.5	7.2%
	Pneumonia a	6	7	33	4.2	6.1	14.4	9.4%
	Total with moisture	44	37	100	30.8	32.2	43.6	37.2%

topsy reports can the full quota of pneumonia be ascertained.

A comparison of the figures obtained in our study with the findings reported by other observers is of interest. Gilman Thompson (2) in 1904 made an analysis of ninety cases of gas poisoning occurring in New York City, and Lämpe (3) in 1921 reported a series of 205 cases treated at the Dresden-Johannstat municipal hospital during the years 1912 to 1921. Only patients sufficiently gassed to become unconscious were included in these two studies. The mild cases were thus eliminated, and a somewhat more serious picture of gas poisoning is presented than the figures given in Table 4 suggest.

Table 5 gives an analysis of the findings in the 514 unconscious patients in our series of cases and may, therefore, properly be compared with the observations reported by Thompson and Lämpe.

The mortality in Thompson's series was 18.8 per cent; in Lämpe's, 17.6 per cent; in ours (unconscious patients only), 22.6 per cent. The first 54 of Lämpe's cases, occurring during 1912, 1913, 1914 and 1915, had a death rate of only 5.6 per cent. During the 1916 to 1921 period the mortality rose to 21.8 per cent. The percentage of carbon monoxide in the Dresden gas during this same period increased as follows: 1913, 8.4 per cent; 1914, 10.8 per cent; 1915, 12.2 per cent; 1916, 14.3 per cent; 1917, 16 per cent; 1918, 18.4 per cent; 1919, 21.6 per cent. This increase in the carbon monoxide content of the gas offers a very probable explanation of the mortality rise.

Of our unconscious patients, 53.6 per cent were breathing at a rate above 26 per minute, the average respiration rate for the entire group being 28 per minute. Thompson reports that in his patients the respiration rate averaged about 30 per minute. In Lämpe's cases the average range was from 24 to 32, the rate being "seldom quite normal."

Thirty per cent of our unconscious patients had a pulse rate, on admission to the hospital, of below 100 per minute; 51.1 per cent had a rate of between 100 and 120; 18.9 per cent had a pulse rate of over 120; the average rate was 107 per minute. Thompson reports marked acceleration of the pulse. The count was seldom below 120 and frequently reached 136 to 140. Lämpe reports a pulse rate of 140 and above in the severe cases, and a tachycardia (no rate specified) in the less serious ones.

Thompson observed an elevation of the temperature in almost all of his patients. In eight cases there was a preliminary fall. Lämpe reports that in most cases the temperature did not rise above 38 deg. C. (100.4 deg. F.) though occasionally it reached 40 deg. C. (104 deg. F.). Of our patients, 17.5 per cent were admitted with a temperature below 97 deg. F.; in 44.2 per cent, the admission temperature ranged between 97 deg. and 99 deg.; in 38.3 per cent, the temperature was above 99 deg.

In discussing the lung findings, Thompson says, "Occasional sequelae are bronchitis, broncho and lobar pneumonia." Later he says, "It was a surprise to the writer that bronchopneumonia, or other definite pulmonary lesion, is not more constantly an outcome of fatal gas poisoning, but in only three of the twelve autopsies was bronchopneumonia observed." The lung findings, however, in the twelve autopsies which he reports showed normal lungs in only 25 per cent of cases. The autopsy findings were as follows: normal, 2

cases; normal, except for a few miliary tubercles, 1 case; congestion (complete), 1 case; congestion and edema (complete), 3 cases; congestion and edema in partial areas, 5 cases; emphysema (partial and compensatory), 4 cases; atelectasis (partial), 2 cases; bronchopneumonia, 3 cases. There is no mention of physical examinations of the lungs of patients who recovered, so we have no means of judging the incidence of transient lung changes in Thompson's cases.

The lung findings reported by Lämpe were the frequent occurrence of bronchitis, 1 case of edema (with frothy sputum), 10 cases of bronchopneumonia, 2 cases of pleuritis without bronchopneumonia, 7 cases of hypostatic pneumonia, 4 cases of aspiration pneumonia, and 2 cases of gangrene of the lungs—a total of 12.7 per cent of cases with lung involvement, exclusive of the cases of bronchitis.

Of our unconscious patients, 20.5 per cent had râles; 7.2 per cent, edema; and 9.4 per cent, pneumonia—a total of 37.2 per cent with abnormal moisture in lungs.

Summary of Section II

An examination of hospital records in three representative eastern cities shows:

1. An average death rate of 14.5 per cent of cases which have passed beyond the stage of first-aid treatment and have become hospital patients.
2. A high average pulse rate.
3. A group comprising 27.8 per cent of the total number studied who have undue moisture in the lungs.

Conclusions

1. No evidence has been obtained from representative gas companies which indicates that either the lungmotor or the pulmotor is superior to the manual prone pressure method of artificial respiration.
2. The evidence obtained leads to the conclusion that if apparatus is to be employed to supplement this simple method of artificial respiration, it should be in the form of some device to provide inhalation of oxygen and carbon dioxide as recommended by Henderson and Haggard.
3. Evidence gathered from hospital records indicates that in gas poisoning any method of artificial respiration which drives air by positive pressure into the lungs may be a source of danger to the patients treated. Devices such as the pulmotor and lungmotor operate in this way and consequently would seem to require further investigation before being recommended for use in gas poisoning.
4. Owing to the fact that other physiological factors enter the problem of artificial respiration in gassing, the Commission has undertaken a series of experiments upon further phases of the problem and will offer final recommendations at a later date. At the present time, the best directions for rescue crews are those already given by Henderson and Haggard—namely, immediate use of the Schäfer prone pressure method of artificial respiration in non-breathing cases, supplemented as soon as possible by oxygen carbon-dioxide inhalations given through a suitable inhaling device.

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Atlantic City 1923

Chicago 1924 and Thereafter Meetings Alternating Annually in the East and the West

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Report of Special Committee of Executive Board to Select Place of 1923 Convention and Exhibition

A canvass of the entire membership, resulting in 1679 replies, of which over 71% of all classes of members, including gas companies, manufacturer companies and individuals, were in favor of Atlantic City for the 1923 meeting place, has led the special committee of the Executive Board appointed to make final decision, to choose Atlantic City in the week commencing October 15, 1923.

An interesting feature of the canvass is that of the western members of all classes 36.5% favored Atlantic City, while of the eastern members of all classes 12.5% favored Chicago.

Apparently the membership has taken cognizance of the fact that Chicago is likely to have unexcelled convention and exhibition facilities by the summer of 1924 and the special committee of the Executive Board in deciding upon Atlantic City for 1923, does so with the recommendation that in 1924 the convention and exhibition be held in Chicago and recommends as the Association's permanent policy thereafter alternating the meetings each year between the East and the West—a course which it believes will meet with the unqualified approval of the entire membership.

R. B. Brown (President), Milwaukee, Chairman
J. B. Klumpp (Vice-President), Philadelphia
Charles A. Munroe (Past President), Chicago
F. A. Lemke (Chairman Manufacturers Section), Kalamazoo
Oscar H. Fogg (Secretary-Manager), Assn. Headquarters.

Special Committee of Executive Board.

GENERAL

CHAIRMEN OF GENERAL COMMITTEES ORGANIZED TO DATE

Accident Prevention—F. W. Fisher, Rochester, N. Y.

Amendments to Constitution—Wm. J. Clark, Mt. Vernon, N. Y.

American Engineering Standards Committee, Representative on—A. H. Hall, New York, N. Y.—(Alternate Representative) W. J. Serrill, Philadelphia, Pa.

Representatives on Sectional Committees—Underground Construction—National Electrical Safety Code—C. C. Simpson, New York, N. Y. Illumination, Nomenclature and Photometric Standards— W. J. Serrill, Philadelphia, Pa. Ventilating Code—Geo. E. Bennett, New York, N. Y. Safety Code Correlating Committee—W. R. Addicks, New York, N. Y.—(Alternate Representative) Donald McDonald, New York, N. Y.

Award of Beal Medal—E. B. Brown, Milwaukee, Wis.

Chamber of Commerce—D. D. Barnum, Boston, Mass.

Cooperation with Educational Institutions—C. N. Chubb, Davenport, Ia.

Finance—James Lawrence, New York, N. Y.

Gas Safety Code—W. R. Addicks, New York, N. Y.

Gas Standards—J. B. Klumpp, Philadelphia, Pa.

Geographic Sections—L. R. Dutton, Jenkintown, Pa.

National Fire Protection Association—R. S. Doull, New York, N. Y.

Nominating—C. M. Cohn, Baltimore, Md.

Rate Fundamentals—R. A. Carter, New York, N. Y.

Rate Structure—T. V. Purcell, Chicago, Ill.

Standard Gas Appliance Specifications—W. T. Ragon, New York, N. Y.

United States National Committee of International Commission on Illumination, Representative on—Howard Lyon, Gloucester, N. J.

The Art of Conciliation*

In America, when an editor rejects your manuscript he does it either with a curt "Declined with thanks," or else sends a printed slip on which he presents his compliments, which you don't want and regrets he cannot grant you what you do want. But when an editor in a certain Oriental country finds that your article or poem or story isn't worth the paper it is written on he sends you a letter like this:

"Illustrious brother of the sun and moon—Behold thy servant prostrate before thy feet. I bow to thee and beg of thy graciousness that I may speak and live. Thy honored manuscript has deigned to cast the light of its countenance upon me. With raptures I have perused it. By the bones of my ancestors, never have I encountered such wit, such pathos, such lofty thought. With fear and trembling I return the writing. Were I to publish the treasure you sent me, the Emperor would order that it should be made the standard, and that none be published except such as equaled it. Knowing literature as I do, and that it would be impossible in ten thousand years to equal what you have done, I send your writing back. Ten thousand times I crave your pardon. Behold my head is at your feet—Do what you will —Your servant's servant—The Editor."

Winning the Public's Confidence

If nothing better could be said about the foregoing letter, it must be acknowledged that the writer had some conception of the Art of Conciliation. The trouble with so many Public Utility employes, is they apparently feel that if brusqueness and abruptness will do the work, why bother about trying conciliation to please? If some interested organization, seeking the truth, were to send broadcast throughout the land this

*From "Winning the Public," by S. M. Kennedy. McGraw-Hill Book Co., Inc.

question, "What is the greatest need of the Public Utility Company of today?" the returning answer would be, "The confidence of its patrons in particular and the public in general." There are many phases of a utility company's business which require more than ordinary attention and many problems yet to solve, but the ever present problem is how to eliminate the lingering prejudice against such corporations. The responsible heads of companies have little difficulty in obtaining the services of competent engineers to construct and operate a property. There is not such trouble in enlisting the financial aid necessary to develop a property if it is located in a thriving territory with growing population, but there is always a difficulty for even the best intentioned corporation when it comes to the question of winning and holding the confidence and good will of a community. The question is often asked, "Why does this unfortunate condition continue to exist?" The answer to the query points in two directions —external reasons on the one hand and internal causes on the other. It is a far cry down the centuries when we look back two thousand years, but before we analyze present conditions it might be profitable to recall some words uttered twenty centuries ago. At that time there lived in Rome a man named Cicero, one of the wisest men whose words and deeds are recorded in the annals of history. He said on one occasion, "It is difficult to tell how much men's minds are conciliated by a kind manner and gentle speech." He must have known that conciliation precedes and induces confidence. If the art existed in Rome in those early days, maybe it can be revived in this country during the present century and applied in such directions as it will do the most good.

The Origin of Distrust

Looking at the external reasons for distrust of corporations, we find that there is more than one page of earlier corporation history written over with true stories of greed, aggression and disregard of public rights. Turning from the past we find that there is more than one latter day example of short-sightedness, breach of faith and mismanagement; added to this is the ever present yellow journal, with its failing for startling headlines, inveighing against the so-called Trusts. Then there are the mouthings of the professional agitator, and the theories and vagaries of the self-appointed reform politician. We cannot deny that the yellow journal, the agitator and the politician have had some excuse for their utterances, because of the mistakes, indifference and incivility on the part of the management of some utility companies under their observation, and with whom they have had to do business.

Turning to the internal causes of public distrust, it might be well for each company through its officials to make a self-examination. Much regrettable history of corporations, which has left its mark to prejudice on the public mind, is not chargeable to any present day company, but existing companies are responsible for what goes on within their organizations. If the public today does not seem to exhibit complete confidence in all a corporation says and does, perhaps it is not the public that is most to blame.

Development of Regulation

The regulation of public utilities by State Commissions has advanced step by step during recent years, and it is in-

evitable that every public utility company in the United States will eventually be subject to the immediate control of some commission responsible to the people. In the main, patrons, consumers, managers, owners and security holders of such properties have been satisfied with the results thus far achieved. Uniform rates have been established, uniform systems of accounting have been put into effect and in some directions uniform methods of operation have been made possible. Some commissions have very broad powers, and while the distinction between regulation and management is recognized, there is always a possibility that regulation may be extended. If a State Commission has power to dictate what rates shall be charged, what shall be the quality of service and the conditions under which it shall be supplied, then why should it not control the personal treatment which shall be given customers by a public utility through its employes? Are not civility, courtesy and attention as much a part of good service as the rate charged or the voltage delivered? These questions are asked, but such minute supervision is not advocated. However, the trend of the times may bring some surprises in this direction. It would not be an improbable thing for traveling representatives of a Commission to drop into some of the public offices of utility companies, just to learn at first hand how the company treats its patrons across the counters and over the telephones, and through this agency a few company managers might be enlightened about the way their assistants are handling the public. Maybe the trend of the times is pointing to something still more radical. Is it not within the bounds of possibility that some commissions might put a premium upon records of broad public policy and the personal touch in managements, and a penalty may be imposed where a company's reputation in this regard is below a desired standard. Such premiums and penalties might be easily provided when rate fixing investigations are under way. All rates are calculated upon a basis to yield a certain net return on the capital invested. An increase of, say one per cent above the average allowed would be a handsome premium for some companies, and a decrease of one per cent would, in some cases, be a severe penalty.

Incentives to Courtesy

Many officials of companies will say, "Oh, things are altogether different now to what they once were—the public is being well treated." For the present it may be acknowledged that there has been a great improvement in matters of this kind. Managers have sent out correctly worded circular letters with carefully prepared instructions to employes as to how the public must be treated. If instructions given were always carried out, conditions would be ideal. But they are not. Time and again a man may be instructed to be considerate, civil and polite, but he will not unless he so desires. Unless a man has within him the desire to be conciliatory and courteous, there are only two ways to make him at least observe the forms of civility—namely, through incentive or fear. If he has ambition to progress and knows that he must follow instructions to do so, he will likely do his best. If he has the fear of losing his position for disobeying he will likely make a brave attempt to do what is wanted. If a company manager wants really to know how his patrons are dealt with, let him send a representative unknown to employes to his dif-

ferent offices to make such inquiries or complaints as are usually made by patrons or the public, and learn how they are treated or answered. Let the representative call up the offices on the telephone asking for information and learn what replies are given or what delays are met with. Some surprises will be in store for the manager who shows this amount of interest in his business. He will learn that he has some clerks who are wonders in diplomacy, and others who handle customers as if they were material to be "eaten up."

The Nature of Service

It too frequently happens among corporation employes that the words "serve" and "service" are not rightly understood. The utility company serves the people and consequently the company, its officers and employes are servants. Dignified service is honorable, and in no way degrading, unless the servant himself degrades it. Life is made up of service—all are servants in some respects, although perhaps masters in others. The motto on the coat of arms of the heir to the throne of England is, "I serve." The policeman on his beat, the judge on the bench and the governor in the capitol, all serve, and the President of the United States is the greatest servant of all, because he serves all the people.

If a servant in a house should become uncivil, inattentive, indifferent or discourteous to his master, would the master be pleased? Would he love that servant and say that he would be delighted to help him to the utmost? No, not likely! The master would probably say to himself, "I will let that fellow go as soon as I can find someone decent to take his place." The relation between the utility company and the public is very similar. The public is the master and the company is the servant. The company exists by virtue of the franchise granted by the public. The public patronizes the company and from the public the company derives its income. The company is the servant and the public is the master. In the very nature of things, the servant must frequently ask the master for more favors—are they granted cheerfully or reluctantly? That depends upon how the servant has pleased the master. Favors asked by companies often look formidable to those who do not understand; but with communities as with individuals, conciliation may be better than logic—they may often be persuaded when they cannot be convinced.

The public is the people, but whom do the people know as the company? Not the bondholders, stockholders, or directors—not the president, secretary or manager—just the employes who transact the company's business with the public. In all truth a company is known and judged by the men it keeps; at any rate, the public knows of no other way to determine whether a company is good, bad or indifferent—no other way to tell whether a company is worthy of confidence or entitled to distrust. If the confidence of the public is the greatest need of the public utility company, then the way to supply what is needed is to conciliate—not one department—but all through the organization; not once in a while, but all the time.

Courtesy Which Convinces

It has now become a habit to lay stress on the word "courtesy" in referring to the relations between a utility company and the public, and it is a good habit.

But there are degrees of courtesy—or rather it had better be stated, there is the imitation and the real article. There is the formal courtesy of the lip and manner, and there is the courtesy that flows from the heart. The former freezes and the latter warms—the one is seldom mistaken for the other. In other words, real civility and courtesy must come from within a man and not from without. Stripped of all verbiage, genuine courtesy is the "doing unto others as you would others do unto you." But courtesy is not all that is required to obtain confidence; there must be conciliation. This word expresses a combination of the attributes which compel confidence—namely, consideration, alertness, sympathy, attention and courtesy.

The paramount question is, how to spread the gospel of conciliation among company employes so that they may be permeated with the knowledge of what the word stands for, and its importance to them and the organization of which they are a part. Connected with every up-to-date electric company, there is a New Business Department, and it is a notable fact that the experienced salesmen attached thereto do not require to have the word explained to them. To use a colloquialism, conciliation is the middle name of every successful salesman. They have learned that there can be no success in their work without courteous cheerfulness. They know that conciliation makes friends, and friends make business for the salesman. Now, if the salesman has learned how to spell conciliation, what has kept the cashier, order clerk, and other office employes dealing directly with the public so backward in their lesson? Because the cashier or order clerk is behind a counter in an office, and the customers go to him to do business, is he any better than the salesman who must go out and seek the customer? Is there any reason why an office man should adopt an air of superiority and talk to the customer impatiently, uncivilly or condescendingly? There is no reason—but even today there are some office clerks so blind that they cannot or will not see the bad light in which they place the company which is paying their salaries, because of lofty indifference and careless discourtesy to the company's patrons.

Selecting Representatives

The principal points of contact between a company and the public should be guarded by employes who have been carefully selected for the position they have to fill. The manager will find that for the good of his company and its standing with the public, he cannot give too much thought to this important matter. The question of salary should not be allowed to interfere with getting good men for such work—or of keeping good men at it. Employes of the wrong stamp are dear at any price. Men who are forgetful, moody, grouchy or dyspeptic should be kept in the background and only such men as are cheerful, alert and considerate should be in the forefront in whatever place or through whatever medium the company may transact its business with its consumers and the public.

Some men are born with a natural desire to win friends by conciliation—a few men may have this quality developed in them by education, and others could never acquire it by any possible way. Most electric companies hold regular or occasional meetings of their employes, and it is suggested that at these meetings those responsible for proper public re-

lations should give a series of "little lessons on conciliation." Employes might be called upon to demonstrate how customers should be handled under different conditions. At each meeting one department should show by actual demonstration the ideal way of pleasing the public from its standpoint. In their turn those in charge of office work, collection department, sales department, trouble department, service department, and telephone exchange should show to others in the company how the work can be done in a manner which will please and make friends. The manager should be on hand to criticize, suggest and point out the value of the right way and the injury resulting from following the wrong way. Such a program would impress employes with the absolute necessity of conciliation, and will produce good results, where circular letters of instruction would not avail.

The Extent of Conciliation

There is an attitude of conciliation which almost every man can assume if he is personally desirous of impressing another to gain a wished-for end. It expresses a desire to please which is clearly visible in the eyes, in the features, in the gestures and in the tone of voice which cannot be misunderstood. This attitude of conciliation is visible not only in personal contact, but may be traced in the wording of letters, and felt in conversations over the telephone. If a man can effectually assume this attitude in personal matters, he surely can also assume it when transacting business for the company which pays for his services. It is the part of the prudent man to conciliate the minds of others and turn them to his own advantage. It is the part of a wise man to conciliate others and turn them to the advantage of the company with which he may be connected and to whom he looks for his future advancement.

Some men think they have done their full duty towards the policy of conciliation if they "meet the customer half way." Some men go a little further and say, "Give the customer the benefit of the doubt," believing that should be sufficient to please and satisfy. But no! perhaps both classes of men have stopped too soon, for in a complaint or controversy, the real attitude of conciliation assumes that "the customer is always right." Before such an attitude, complaints are forgotten, troubles vanish, and opposition fades away. The attitude of conciliation does not mean a loss of self-respect or the relinquishing of any rights. On the contrary, the implied consideration for the feelings and rights of others adds dignity to a position and costs absolutely nothing.

Representatives of a corporation, in its defense, will sometimes state that it is only an aggregation of individuals, and that the corporation should not be blamed for individual transgressions. What is the public but a greater aggregation of individuals who like their individuality recognized?

The corporation whose employes consistently practice the Art of Conciliation when coming in contact with its patrons will realize some day that, having pleased the individuals, it has finally won the much desired confidence of the public.

* * *

MEMBERS!

There are 73,000 persons engaged in the manufactured gas business, approximately 2,500 of whom are members of the American Gas Association.

The employment turnover among 73,000 individuals is a serious problem,—in any business, it imposes a big expense in time and money to continually train new employees and any incentive to reduce such turnover is effort well spent.

There are thousands of individuals who by reason of a more intimate knowledge of the gas business and its problems and solutions would become increasingly valuable to themselves and their companies.

An opportunity is open through membership in the American Gas Association for thousands of men to become more thoroughly sold on the gas business and they in turn will exert a correspondingly helpful influence on other thousands of their friends and customers of their companies. After all, it is the personnel of the organization and not the name of the Company which is responsible for the prosperity of the Company and its public relations.

The doors are now open and an invitation is extended to any individual in the gas business to join now on the basis of a half year's dues for the balance of our fiscal year ending on September 30th.

Surely there are men in your organization who would welcome having this invitation extended through an executive officer of their Company.

It looks to us like a good investment for your Company.

* * *

Who will help build our membership up to 5,000?

Standardization from the Consumer's Point of View

N. F. HARRIMAN

IN RECENT YEARS attention has been concentrated upon the material and mechanical side of production and distribution in industry. Physics and chemistry have revealed the secrets of raw materials and the modern manufacturer can determine the most suitable material and the most economical method of treating it to obtain the desired results.

One of the most modern aids to industry is standardization, which is now recognized as being of the greatest importance to both producer and consumer. It is sometimes said that the benefits of standardization are mainly to the field of production. This is not the case. They are quite as important to both the field of buying and of selling.

In industrial standardization it is the consumer who is ultimately benefited most, but the immediate benefits are largely to the producer, for it at once simplifies his work and enables him to produce what is required by the consumer cheaply and expeditiously. With lower production costs comes more extended use of the standard article, for it is a law of economics that when costs increase substitutes are used.

Duration of Standards

Objectors to standardization frequently urge that it would stifle initiative and progress and that the adoption of a standard prevents advance through improvements in the arts of manufacture. Of course, this is not the case. A standard should remain standard only until something better is developed, but it should not be changed until justified from all points of view. Any given standard, to achieve its object, must be suitable for the intended use in the majority of cases. The exceptional case requires special consideration, and actual perfection will never be attained. The economies and benefits of standardization as applied to qualities of products and processes of manufacture have been so thoroughly demonstrated within the past few years that they are entirely outside the argumentative field.

Standardization, like efficiency, is not an easy term to define; it is not always understood in its true sense and by many is looked upon with doubt and suspicion. The general idea of standards is not new but its application to science, engineering and industry has been developed within comparatively recent years.

Standardization may be defined as the unification of the methods and practices involved in manufacture, construction and industry, and all lines of endeavor which present the necessity of repetition work. It may be considered under several aspects.

Common Business Speech

Standardization of nomenclature enables buyer, seller and manufacturer to use and understand the same language. It is very important that there be acceptable definitions of terms used in specifications and contracts. Purchasing is often done by persons who are quite familiar with the legal side of drawing up contracts, but who are not familiar with the technical details involved. The efficiency of many purchasing officers is

lessened by their lack of knowledge of the nature and names of the articles they are intrusted to buy.

Standardization of variety, of simplification, involves the elimination of unnecessary types, shapes, grades and sizes of manufactured articles. Waste in industry is largely due to an overmultiplicity in the number of products, as well as to inefficiency of process. Waste due to idle stocks of material and products through deterioration, obsolescence and capital charges carried, is large, especially with large stocks.

Dimensional standardization insures ready interchangeability of supplies, and the proper inter-working of parts which may be manufactured or assembled by different manufacturers.

Standardization of specifications and methods of test puts bids on an easily comparable basis, promotes fairness in trade competition, and ensures the proper grade of material for a given use.

Extent of Standardization

The amount and intensity of standardization work now being done all over the world is surprising. One continually hears of "mass production" and the statement that the extensive introduction of it into industry through standardization is an economic necessity. National industrial and engineering standardizing bodies have been formed and are now functioning in fifteen of the most prominent nations of the world.

Germany has been especially active in dimensional standardization, while the efforts of the British and American standardizing bodies have been directed more particularly towards matters concerned with purchases and contracts, such as specifications for materials, performance of machines and devices, methods of test, etc. A notable exception to this general statement is the dimensional standardization work of the automobile industry in this country.

From a broad viewpoint, standardization may be applied to materials, methods, products and uses.

Materials: The raw materials used in the manufacture of a product must be of standard and uniform quality, if the process of manufacture and the grade of the product are to be maintained. Sometimes it costs a little more to adhere rigidly to definite standards for raw materials, but the economies effected offset this.

Methods: A product made continuously from standard grade material more readily permits standardization of each step in the process of production. This is attained by the adoption of the one best and most economical method of doing each thing as taught by plant and engineering experience, and making it standard practice.

Product: A standardized product, made to definite specifications permits an output to the maximum uniformity possible within the limits of manufacturing skill. A uniform product made and sold continuously permits a steady production schedule, building up stocks during periods of low demand and depleting them during periods of high demand. On the unstandardized basis, the only alternative is to follow the "feast and famine" method. The definitely standardized product is manufactured to meet particular wide needs, according to definite specifications, and is constantly tested to insure its being up to standard grade. The ordinary purchaser is not an expert on quality of supplies, and in many cases the quality can be lowered

and he would be none the wiser until the material is put into service.

Uses: One type, shape, grade or size of an article will not meet all the requirements of the consumer, neither is it desirable to have such an extensive variety that the differences are small and meaningless. The ideal condition is to have just enough variety to meet all the real needs with no overlapping. Sound industrial economy demands the elimination of the special or little used product and its substitution by the standard or most widely used and most efficiently produced goods.

Concerning Specifications

Standardization of specifications is the most important phase of the subject, from the purchaser's viewpoint. It is the first and most essential step in the economy that arises from the purchase of materials or supplies in large quantities, and is a necessary factor in the improvement of the quality of materials purchased and the adaptation of quality to definite uses. The specifications is the common meeting ground for the manufacturer, dealer and user, and it is at once a statement of the user's needs and what the maker is required to supply.

Purchase by competitive bids on specifications is preferable to purchase on sample. The latter method implies that each bidder's product must be considered independently, and it is often a very difficult matter to decide between different combinations of quality and price. The specifications should include limiting values for the properties necessary to meet the required service, with proper tolerances.

A proper specification is one which enables bidders to know exactly what is desired or required and what procedure the purchaser will follow to satisfy himself that the specification has been complied with. Defective and incomplete specifications, whether due to compromise of quality for temporary economy, or through lack of data, should be replaced by those in which the best magnitude of each property involved is so specified as to predetermine the definite quality best meeting the need. There is a growing appreciation of waste in industry due to the use of defective and improper materials.

To determine the value of any material for a given purpose, its properties must be measured, assuming that the properties upon which its use depends are known and are measurable. The testing of materials may prove a needless waste of time, energy and money unless due consideration is given to the nature of the tests applied, the conditions under which they are made and the interpretation of results.

Quality may be determined directly by a service test, indirectly by a test under simulated service conditions, or still less directly by a laboratory test of individual properties upon which the quality is known or assumed to depend. These may vary from a simple visual inspection to an investigation involving laboratory and technical work of the most difficult and precise nature.

Friction and controversy between buyer and seller often arise as to the question of facts concerning the results of tests, especially when different methods or different equipment are used. Standardized methods of test consider all of these conditions, and are a necessary part of an ideal specification for a material or a manufactured article.

Governmental Action

The United States Government is probably the largest purchaser of materials and supplies in the world, and the greatest impetus that could be given to standardization from the purchaser's point of view would be for the Federal government to adopt standard purchase specifications for the more important materials and supplies purchased by it. This has recently been initiated by the establishment of the Federal Specifications Board, in the office of the Bureau of the Budget, which has brought together the experts of the various departments. As a result specifications representing the best commercial and engineering practice are being selected for the use of all departments and bureaus alike in the purchase of supplies.

The selection and adoption of specifications or standards without due regard to the manufacturing problems involved would be equally as serious as for manufacturers to establish standards without a careful consideration of the needs of the purchaser. In the selection of specifications for government use, the Federal Specifications Board is coordinating these two interests, and the standards adopted will eventually be used for all government purchases. This procedure will undoubtedly serve as a model to be followed by corporations, municipalities, states and the general public.

With many large corporations the standardization of purchases, and the resulting simplification of store stock varieties of materials, offer a fertile field for economy, and the purchasing officer with a technical knowledge of materials and supplies, together with a knowledge of standardization principles, is best equipped to secure maximum results.

Advertise the Slogan

THE OFFICIAL slogan of the Association and of many of our company members—and a few of our manufacturer company members—is "If It's Done With Heat, You Can Do It Better With Gas."

Before this article is published you will see the slogan on the Association's stationery. It is also blossoming out on the stationery of many of our gas companies, and it is just beginning to see the light of day in some of the national advertising placed by our manufacturers.

But we need better support than that if we expect to put over the slogan nationally—and we do expect to. Advertising offers the best means—newspaper advertising and particularly advertising in such periodicals as the Saturday Evening Post, Literary Digest, etc.

Pass the word along to your advertising man or agency. Tell them to play up the slogan in every piece of advertising copy that is written. Then be sure to send us samples of the advertisements so that we can have proof of your cooperation and use your good work in converting others.

Eastern States Gas Conference

THE EASTERN States Gas Conference, the joint meeting of the New Jersey Gas Association and the Pennsylvania Gas Association will be held at The Hotel Belvue Stratford, Philadelphia, Pa., on April 11th, 12th and 13th. A most comprehensive program has been prepared covering such subjects as House Heating, House Piping, from both the architects' and plumbers' standpoint, Water Heating, Gas Meters and Services, Public Relations, Gas Lighting and A. G. A. Specifications. Many prominent speakers have been secured both for the sessions and for the banquet which will be held on the evening of April 12th. Among them may be mentioned General Amos A. Fries, chief of the Chemical Warfare Dept., U. S. A., Dr. J. Duncan Spaeth, of Princeton University, and Mr. R. B. Brown, President of the A. G. A. This attractive program given below in detail, should merit a large and enthusiastic attendance.

Program of Annual Meeting

Eastern States Gas Conference, Pennsylvania Gas Association and New Jersey Gas Association

Annual Meeting—Pennsylvania Gas Association.

Wednesday, April 11th, 10:00 A. M.

Opening Meeting of Gas Conference.

Wednesday, April 11th, 11:00 A. M.

Address of Welcome—Mr. Charles P. Vaughn, President Philadelphia Chamber of Commerce.

Address—Mr. P. H. Gadsden, President Eastern States Gas Conference.

Address—Outline of American Gas Association Activities and the Co-ordination of Geographic Division—Col. Oscar H. Fogg.

HOUSE HEATING—2:00 P. M.

Opening Speaker—Mr. N. T. Sellman, Ass't Secretary-Manager, American Gas Association, New York.

Discussion—Mr. Thomson King, Sales Manager, Peerless Heater Company, Pittsburgh, Pa.

Mr. L. B. Eichengreen, U. G. I. Company, Philadelphia, Pa.

Mr. A. Hurlburt, Vice Pres. and General Manager, The Philadelphia Company, Pittsburgh, Pa.

Mr. E. P. Bailey, Jr., Sales Manager, Bryant Heater & Manufacturing Co., Cleveland, Ohio.

Mr. R. C. Cornish, Engineer, American Gas Company, Philadelphia, Pa.

Mr. H. O. Loebell, Henry L. Doherty & Co., New York City.

HOUSE PIPING—4:00 P. M.

House Piping for Gas from the Viewpoint of the Architect—Mr. Robert R. McGoodwin, Philadelphia, Pa.

Will the Plumber Sell House Piping for Gas and How the Gas Company Can Assist Him—Mr. John A. Quinn, President Master Plumbers' Association, Philadelphia, Pa.

Discussion—Mr. L. N. Yetter, New Business Manager, Atlantic City Gas Company, Atlantic City, N. J.

Thursday, April 12th

WATER HEATING BY GAS FUEL—10:00 A. M.

Why the Gas Company Should Sell Automatic Hot Water Service—Mr. H. J. Long, The Kompak Company, New Brunswick, N. J.

How to Sell Automatic Hot Water Service—Mr. B. H. Atwood, Sales Manager, Wilmington Gas Company, Wilmington, Del.

How to Install Automatic Hot Water Service—Mr. George B. Baines, 3rd, Engineer, Harrisburg Gas Company, Harrisburg, Pa.

Records and Information Valuable in Selling and Servicing Automatic Hot Water Service—Mr. R. A. Koehler, Public Service Gas Company, Newark, N. J.

Why Should Consumers Purchase Automatic Hot Water Service—Mr. Jacob Jones, Manager, Bridgeton Gas Company, Bridgeton, N. J.

METERS—11:00 A. M.

Meter Testing for Capacity and Accuracy from American Gas Association Committee Reports—Mr. W. A. Castor, Supt. of Meters, U. G. I. Company, Philadelphia, Pa.

Proposed Schedule of Meter Capacities and Resultant Economies in Capital Investment, Consumers' Supply, Etc.—Mr. Walton Forstall, Engineer of Distribution, Philadelphia Gas Works, Philadelphia, Pa.

Resumé—Brown's Reports—Meter Deposits—Mr. W. H. Fulweiler, Chief Chemist, U. G. I. Company, Philadelphia, Pa.

Lambskins and Their Relation to the Meter Industry—Mr. L. J. Stiles, A. C. Lawrence Leather Co., Boston, Mass.

Discussion on Meter and Consumer—Mr. Charles W. Risley, Sales Manager, The Public Service Gas Company, Jersey City, N. J.

Age, Service Changes and Records of Proof of Gas Meters—Mr. H. A. Norton, Manager, Tufts Meter Works, Boston, Mass.

Meters and Meter Readers—Mr. H. H. Newman, Manager, The Public Service Gas Company, Trenton, N. J.

Distribution Problems—Speaker to be announced.

MAINS, METERS AND SERVICES

Mr. William Naile, The Consumers Gas Company, Reading, Pa.

Mr. Emil Bartel, Supt. of Meters, Brooklyn Union Gas Company, Brooklyn, N. Y.

Mr. J. H. Muller, Supt. of Meters, Consolidated Gas Company, New York City.

ANNUAL MEETING, REPORTS OF COMMITTEES, ELECTION OF OFFICERS
NEW JERSEY GAS ASSOCIATION

12:30 P. M.

2:00 P. M.—Employees and Public Relations—Mr. C. N. Lauer, Day & Zimmerman, Philadelphia, Pa.

Gas Lighting—Demonstration and Exhibition—Mr. J. R. Stetser, The Welsbach Company, Gloucester, N. J.

Gas Ranges—American Gas Association Specifications—Mr. William T. Rasch, Engineer of Utilization, The Consolidated Gas Company, New York City.

Discussion—Mr. H. N. Christmas, William M. Crane Company, New York City.

Mr. J. D. Taylor, Baltimore Gas Appliance and Manufacturing Company, Baltimore, Md.
Mr. Stanley Grady, Roberts & Mander Stove Company, Philadelphia, Pa.

Banquet—7:30 P. M.—Mr. P. H. Gadsden, Toastmaster:

Speakers:
Mr. R. B. Brown, President, American Gas Association.
General Amos A. Fries, Chief, Chemical Warfare Service, U. S. A.
Dr. J. Duncan Spaeth, Princeton University.

Ladies Invited—Vocal Quartette—Orchestra.

MEETING FOR EXECUTIVES AND MANAGERS OF GAS COMPANIES

Friday, April 13th—10:00 A. M.

Address—Speaker to be Announced.
Response and Comment.
Public Utility Regulation—Mr. H. C. Spurr, Editor, Public Utility Reports Annotated, Rochester, N. Y.

In Memoriam

Frank J. Baker, Vice-President, The Public Service Co. of Northern Illinois.

John Doyle, Supt. of General Lighting Division, Consolidated Gas Co., N. Y.

Roy M. Buell, Efficiency Engineer, Melbourne, Australia.

New Members

GAS COMPANIES

Citizens Gas & Electric Co.,
A. L. English, Mgr.,
Council Bluffs, Iowa.

Wisconsin Public Service Corp.,
J. P. Pulliam, Mgr.,
Oshkosh, Wisc.

The Ohio Gas Light & Coke Co.,
J. A. Sloan, Treas.,
Napoleon, Ohio.

Norwood Gas Company,
Arthur B. Rodgers, Mgr.,
Norwood, Mass.

Rome Municipal Gas Co.,
S. E. De Frese, Pres.,
Rome, Ga.

Iowa Public Service Co.,
C. A. Clark, Vice-Pres.,
Ames, Iowa.

Winchester Gas & Electric Light Co.,
W. A. Ryan, Sec.-Treas.,
Winchester, Pa.

MANUFACTURERS

Holyoke Heater Company,
John H. Conant, Treas.,
Holyoke, Mass.

Somerville Stove Works,
Alfred E. Howell, Genl. Mgr.,
Somerville, N. J.

Sunshine-Jasper Co. Inc.,
Monroe Sunshine, Pres.,
New York, N. Y.

McClary Manufacturing Co.,
J. M. Gunn, Asst. Genl. Mgr.,
London, Ont., Canada.

ACCOUNTING SECTION

J. W. HEINS, Chairman — W. A. SAUER, Vice-Chairman

H. W. HARTMAN, Secretary

MANAGING COMMITTEE—1923

At Large

BRINE, F. A., Atlanta, Ga.
CASSELL, W. H., Baltimore, Md.
DAVIDSON, H. C., New York, N. Y.
DOHRING, W. A., Boston, Mass.
FENNIMAN, J. R., New York, N. Y.
HALL, I. S., Boston, Mass.
HOFFMAN, F. C., St. Paul, Minn
JEFFREY, JOS., Scranton, Pa.
LAWALL, H. J., Philadelphia, Pa.
LAWRENCE, JAMES, New York, N. Y.
LYNCH, B. W., Chicago, Ill.
MEYERS, W. J., New York, N. Y.
MURFIT, W. C., Newton, Pa.
PATTERSON, F. H., Rochester, N. Y.
POTTER, O. F., Newark, N. J.
RASTENBURG, F. G., Indianapolis, Ind.
REESE, J. G., Baltimore, Md.
SCHMIDT, JR., WM., Baltimore, Md.
SCOTT, J. M., Wilmington, Del.
SHORT, A. F., Providence, R. I.
TOSSELL, A. L., Chicago, Ill.
WINTERS, A. C., Chicago, Ill.

Representing Affiliated Societies

ARMSTRONG, J. J., Toronto, Can. (Canadian)
CLINTON, DEWITT, Worcester, Mass. (N. E. Gas Eng.)
DEAL, E. C., Springfield, Mo. (Missouri)
GOODNOW, A. C., Jacksonville, Fla. (Southern)
HAASE, EWALD, Milwaukee, Wis. (Wisconsin)
HODGE, E. W., San Francisco, Cal. (Pacific Coast)
JAMES, F. M., Aurora, Ill. (Illinois)
KUNTZ, ADAM, Detroit, Mich. (Michigan)
McCABE, J. B., Dallas, Texas (South Central)
PETTES, W. H., Newark, N. J. (New Jersey)
PHILLIPS, R. E., Lincoln, Neb. (Iowa)
PORTER, EDWARD, Philadelphia, Pa. (Pennsylvania)
SCORELL, E. C., Rochester, N. Y. (Empire State G. & E.)
SHARON, B. P., Hammond, Ind. (Indiana)
WILBUR, A. A., Brockton, Mass. (Gas Sales of N. E.)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Budget—F. H. PATTERSON, Rochester, N. Y.
Customers Accounting—W. A. DOHRING, Boston, Mass.
Fixed Capital Records—H. J. LAWALL, Philadelphia, Pa.
Insurance—J. G. REESE, Baltimore, Md.
Nominating—EWALD HAASE, Milwaukee, Wis.
Relations with Customers—A. L. TOSSELL, Chicago Ill.
State Representatives and Contributions to Monthly—JAMES LAWRENCE, New York, N. Y.
Uniform Classification of Accounts—W. J. MEYERS, New York, N. Y.

What Some Companies Are Doing to Gain the Customer's Good-Will

LOUIS STOECKER, Traveling Auditor, Public Service Gas Co., Newark, N. J.

First Article of a Series dealing with the Relations of Company and Customer. (EDITOR'S NOTE.)

THAT THE best advertisement is a satisfied customer is just as true of a utility company as it is of the corner merchant. The very life of a utility is dependent upon public sentiment. More and more, the growth, progress, and general welfare of the utilities are predicated upon and swayed by public opinion. When that public opinion comprises an aggregation of satisfied customers it is called good-will and can only be gained and held by the right kind of service.

This is not a new conclusion; it has long been a well recognized fact. And with it comes the problem of how this right kind of service to the customer can best be rendered.

This question is one of the most vital and of the utmost importance confront-

ing the utilities today. Its correct solution together with a wide customer ownership of utility securities will obliterate many of the present day utility troubles.

The subject of service to the customer covers a wide scope. It leads to many diversified channels and in some way or another touches practically every activity and department of a utility company. Therefore, an attempt to cover the subject at one writing would result only in generalities.

With this in mind, it is the purpose of this article to treat only of one phase of the general subject of service—order taking and the performance of the order —and in this, to give in outline only the writer's observations of this work by companies in the east and middle west which he had the good fortune to visit recently in making a study of service to the customer and relations with the public.

Briefly, service relating to order work resolves itself into two fundamentals; the approach of the customer, and the fulfillment of the customer's order.

The approach of the customer to make known his wants and to arrange for them should be made as easy and with as little loss of time to himself as possible.

The fulfillment of the order is the real test of the quality of service given. It should embody promptness, efficient workmanship, and satisfaction to the customer with little or no inconvenience to the latter.

These features were looked for and in various forms and degrees were found in the systems of the companies visited.

In two companies the initial part played by the customer to obtain service is reduced to a telephone call. The first consideration of these companies is to give service. The signing of the application, investigation of credit, and question of deposit are secondary and are taken up only after service is given.

There is no necessity for the customer to come to the office except to clear a matter of credit or on a question of deposit, but even then, he is enjoying the service of the company and neither he nor his family are inconvenienced at home.

A deposit is requested only after the company's investigation shows a poor credit rating or that the customer, in other ways, represents a risk not to be taken without a deposit protection. The amount of deposit is then based on an estimated consumption as arrived at by a reading of the customer's meter. In this way, basing the decision on conditions as nearly actual as possible rather than by using an arbitrary figure, an amount of deposit is reached that is equitable to both the customer and company.

The liberal policy of meeting the customer's requirements first and the company's afterwards, is the strongest incentive for both the company and the customer to use the telephone for initial and subsequent service. From observation, it appears that the major part of order taking and calls for service are handled by telephone.

For this purpose a large telephone table board is maintained by each company. The employes handling the board are thoroughly instructed in the policy of the company, the routing of an order, the conditions and problems of the operating department, and the business in general so that they are well versed in the many sides of the company's activities. They also have available for immediate reference, all data that may be necessary to answer a customer; such

as rates, prices of merchandise, etc. Above all, they have direct connection with a suspense file of all uncompleted service applications, orders, complaints, etc., with daily reports of reason for delay so that the status of a customer's order can be given quickly when call is received.

In order to obtain a longer work day and thus handle orders expeditiously with resultant satisfaction to the customer the operating department of one of the companies under consideration has its organization working in three shifts (from 8 a. m. to 11 p. m.), each shift overlapping the other, although the individual workman is on an eight-hour basis.

Going to a smaller situation, the writer found that on account of a modification of the broad policy of giving service as described above, not as much business is handled by telephone. Here, all initial applications for service must be made in person at the company's office, although subsequent calls for service, transfers, complaints, etc., may be and are handled by telephone. To take care of this telephone work, a similar installation of a table board is maintained, although naturally, not on as large a scale.

This company has more customers calling at its order counter than were noticed at the order counters of the above mentioned companies. This is not due solely to the modification of policy, but also to the character and size of the city. Many of the customers whose business could undoubtedly be handled by telephone come to the office. The fact that the company's office is in the center of the community's daily activities to which probably some member of the family comes each day, accounts for the larger number of personal calls.

At the order counter of this company card record files of credit and of meter locations are maintained.

Reference to the credit file while the customer is at the counter or on the telephone will quickly bring to light his credit status. Any question of credit can be settled at once in the case of a personal visit, or if a telephone call, the customer is advised immediately so that he can call and clear the records. This saves time and eliminates what, in many instances, would result in a second call to the office and a delay to service, if the credit status is not learned until the customer has departed from the office.

By having the meter record file at hand, which is also referred to while the customer is present, the character of the order is at once determined so that dispatching can be made to the shop without further delay. Again, with this information before him, the order department representative can intelligently answer any of the customer's questions of the availability of service and can advise him of the exact conditions surrounding his case. Further, this record will usually develop whether a house service or main extension is necessary, and if such is the case, arrangements can be started at once with the customer, thereby probably saving him another trip to the office and giving him at the start a full understanding of the situation and of the incidental delay in giving him service.

Concentration of order taking and order executing in the operating department and the further concentration of all order executing in one man in each district of the company are the outstanding features of another company on the itinerary of the writer.

By centering in one department the

taking of orders and their execution, this company is eliminating the time usually lost where these functions are performed by two departments in widely separated locations. To accomplish this purpose, the customer on account of the wide latitude given the district operating man as will be described, is given every encouragement to use the telephone. In case he should call in person at the office, it is planned to transmit the order to the operating department by telautograph. This is now handled by messenger service.

Telephone calls for service go direct to the operating department where they are received on a telephone table board installation such as already mentioned. Upon receipt of a telephone order, the customer's name is placed at once on a telautograph operating between the table board and the credit department of the office. The credit records are immediately searched and if satisfactory, an O. K. is given to the telephone operator by telautograph. The operator is then in a position to tell the customer that service will be given. Or, if a credit obstacle to service appears on the record, the information is transmitted via telautograph to the operator who, in turn, transmits the information to the customer with the statement that records must be cleared before service is given.

Likewise, when a customer calls in person at the office, his credit status is immediately ascertained from a card record file of credit and if there is any credit question to interfere with his order, he is advised and given the opportunity to clear the record.

The unusual features of the service work of this company are found in the execution of orders, by, and in the organization of the operating department in which the success of any service system finally stands or falls.

The territory of this company is divided into districts, each district being in charge of an operating department representative. This district man is furnished with an automobile equipped with meters, a pump, a box of tools, pipe and fittings, a box of lighting appliances, and a stepladder. He takes care of all manner of service to the customer and is in every sense of the word the company's representative in that district.

His work includes the handling of all orders from the customer; complaints of every character, turn on and shut off of meters, setting and removing of meters, and adjusts consumer's appliances. In addition, he sells appliances, takes contracts for service, collects deposits, delivers small appliances, and can, if necessary, deliver a gas range in emergency. He also gets necessary information in his district for the office and obtains customers' signatures, if required.

He will do any work he is called upon to do by people in his district, without order from the office, the matter of credit being left to his discretion, or in case of doubt, he has recourse to the telephone.

Every two hours, these district men call the dispatcher by telephone at which time any orders received by the operating department are relayed to the district man, and at noon the men come to the shop for such orders and to report the work done. The telephone calls by the district man are made wherever he happens to be, usually from a customer's premises. To reach the dispatcher at these two-hour calls, the district man uses a private trunk line having a separate number from that of the company's public telephone number.

This system naturally calls for an all-around operating man of high type with some business and selling ability. At the time of the writer's visit three university graduates were working in this capacity.

The aim of the system is to offset as far as possible some of the features in the large organization of today which have no appeal to the public. The endeavor is made by creating a personal contact with the customer through the personality of the individual man. This contact is secured by keeping that man in one district for all work and thereby enable him to learn his customers, collectively and individually, and to enable them in turn to become acquainted with the man. In short, the system endeavors to make the company's representative a familiar, and in case of need, a welcome figure in the daily routine and life of the neighborhood.

The writer was particularly impressed by the general motorizing of the operating departments of the companies visited. In addition to this means of rapid transportation and just as important, probably more so, is the fact that the operating men handling orders of a general character are equipped to meet all conditions ordinarily found and to give service upon the first call.

Southwestern Public Service Association Meeting

The Southwestern Public Service Association and the South Central Gas Association will hold a joint convention at Ft. Worth, Texas, May 15-16-17, 1923. In addition to an unusually strong Convention program, which is now under preparation, this Convention will mark the merging of these two Associations which will function thereafter under the name of the Southwestern Public Service Association.

Magazine Publicity

An illustrated article entitled "How Gas Is Manufactured" appeared in the January issue of *The Commonwealth,* published at Grand Rapids, Mich. The article was placed by Alfred Fischer, Director of the Michigan Committee on Public Utility Information.

Accounting Section Notes

SINCE THEIR organization meeting December 6th, the Insurance Committee's work has consisted largely of having adopted and actually applied the new schedule of fire insurance rates on gas properties. In Information Service No. 40 we reported that six had had reratings under the new schedule with average reductions in premium rate up to the 25% anticipated. Since then three other companies have reported reductions in excess of the 25% figure and Mr. J. G. Reese, Chairman of the Committee, reports that a rerating of the Baltimore properties resulted in a reduction of premiums of 17% on the gas properties and 34% on the electric. The Committee is taking up with the Insurance Bureaus old cases where reratings under the new schedule do not result in satisfactory reductions in rates, with the idea of investigating and remedying such conditions. It is important, therefore, that all member companies take up promptly with the Chairman, Mr. J. G. Reese of the Baltimore Consolidated Gas Electric Light & Power Company, all matters relating to reratings of their plants under the new schedule.

The Committee is preparing a self inspection blank to be used by member companies in connection with fire prevention work. This is being submitted to various Insurance Inspection Bureaus for comments and should prove particularly useful to those companies which have not at present an established inspection system for fire prevention.

The Committee is also endeavoring this year to gather statistics as a means of securing a reduction in the base rates on workman's compensation and liability insurance, similar to the reduction obtained on fire insurance premiums.

The following summary has just been made up of the Insurance data compiled by last year's committee covering premium losses, etc., for the year 1921.

Companies		
Reporting insurance carried	298	
Reporting no insurance carried	149	
Failing to reply	299	746
Meters in use		
By insuring companies	4,343,427	
By self-insurers	1,542,059	
By non-reporting companies	1,662,745	
	7,548,231	
Total amt. of insurance carried	$66,423,646	
Total premiums paid	317,752.36	
Total fire losses	60,995.88	
Percentage of losses to premium	19%	
Average rate per $100.00	47c.	

It will be seen that while the number of companies reporting represent approximately 60% of the total number circularized, they represent 78% of the total number of meters. Of the 299 companies failing to reply, but 42 have over 5,000 meters.

Customers' Accounting Committee

Following up their most interesting report at the last convention, this committee are making satisfactory progress in securing comparable cost figures on the customers' bookkeeping work of typical companies, this data to include only:

Bookkeeping Costs
Addressograph Costs
Billing Department Costs

In addition the committee is following up the tangible economies effected by member companies that have adopted the so-called system of "Bookkeeping

without Books" which will afford a most interesting comparison with cost figures on the typical system referred to above. As reported to date the following situations have adopted the system of "Bookkeeping without Books":

Consolidated Gas Electric Light & Power Co., Baltimore, Md.
Rochester Gas & Electric Corporation, Rochester, N. Y. (in modified form)
Allentown Bethlehem Gas Co., Allentown, Pa.
Consumers Gas Company, Reading, Pa.
Harrisburg Gas Company, Harrisburg, Pa.
Counties Gas & Electric Co., Norristown, Pa.
Public Service Gas Company, Chicago, Ill. (in some situations)
Philadelphia Company, Pittsburgh, Pa.

In addition the system is now being introduced into two districts in Philadelphia and it is expected the entire city will be operating under this system by the end of 1923.

Further work is being done on merchandize accounting, and it is probable that the committee will have another exhibit of forms and systems at the 1923 convention.

Committee on Fixed Capital Records

The membership of this committee has been divided into an eastern and western group and the committee's program assigned as follows:

The designing of a standard or model system for keeping Fixed Capital Records with forms and plans:

F. L. Conrad, Chicago
A. C. Winters, Chicago
Wm. Wurth, Chicago
L. T. Smith, Milwaukee
C. L. Nelson, St. Paul

The procuring of complete descriptions with forms of three systems now in use by gas companies for keeping Fixed Capital Records:

E. L. Heyser, Allentown, Pa.
H. C. Davidson, New York
H. J. LaWall, Philadelphia

To make a complete list of all indirect and undistributed costs and discuss the relation of these items to Fixed Capital; to recommend definitely a method of distributing these costs to individual projects in order that they may become a part of the Fixed Capital Records:

A. C. Klein, Boston
C. A. Schlegel, Philadelphia

All of the above work will be criticized and reviewed by the committee as a whole before incorporation in the final report.

Uniform Classification of Accounts

Since the report of this committee in Atlantic City last year Illinois and Tennessee have joined the ranks of the states which have adopted the Uniform Classification. A recent survey made by the committee indicates that the present status with regard to adoption of the Classification is as follows:

Colorado	Under consideration
District of Columbia	Under consideration
Illinois	Adopted
Massachusetts	Adopted (slight modifications)
Maine	Under consideration
Michigan	Adopted
Pennsylvania	Under consideration
Tennessee	Adopted
Utah	Adopted
Vermont	Under consideration
Virginia	Adopted
Washington	Under consideration
Wisconsin	Adopted

State associations and local accountants in states which have not taken action on the classification have been requested to take such action as they consider proper to bring about its consideration by their state commission.

Budget Committee

The work of this Committee has been subdivided as follows:

Operating Budgets, Edward Porter, Philadelphia

Construction Budgets, H. C. Davidson, New York
Cash Requirements, Materials & Supplies Budgets, W. S. Barker, Newark

Each member of the Budget Committee is submitting to the above gentlemen a resume of the budget practice in their companies, together with forms used, and the Committee's report when completed will consist of a primer built up primarily on the best features of the budget routines in the larger companies, but so arranged that it can be used by the smaller and medium sized companies as a reference.

Committee on Relations with Customers

The work of this Committee was fully outlined in the March issue of the Monthly. The work of the sub-committees is progressing nicely and will be carefully reviewed together with that of other committees at the following series of meetings to be held in Chicago in March:

Committee on Relations with Customers, 1731, Peoples Gas Bldg., March 16.
Committee on Customers' Accounting, 1523, Peoples Gas Bldg., March 16.
Budget Committee, 1619, Peoples Gas Bldg., March 16.
Managing Committee, 1621, Peoples Gas Bldg., March 17.
Fixed Capital Records, 1631, Peoples Gas Bldg., March 17.

Approximately thirty-five accountants from all parts of the country will be present at the above meetings and at a dinner to be given in the dining room of The Peoples Gas Light & Coke Company, March 15th.

The Self-Corrosion of Buried Lead Pipes

This is the report of an investigation made by W. Nelson Smith, Consulting Electrical Engineer, Winnipeg Electric Railway Co., and J. W. Shipley, Ass't Professor of Chemistry, University of Manitoba, which may be of interest to our members.

Peak Send Out Figures--1923

Consolidated Gas Co. of N. Y.	**February 23,**	**1923—195,000,000**
The Brooklyn Union Gas Co.	**February 15,**	**1923— 95,000,000**
The Peoples Gas Light & Coke Co.	**"**	**1923—111,000,000**

ADVERTISING SECTION

B. J. MULLANEY, Chairman — J. M. BENNETT, Vice-Chairman

CHARLES W. PERSON, Secretary

MANAGING COMMITTEE—1923

At Large

BARNES, CYRUS, Boston, Mass.
BLANCHARD, FRANK, L., New York, N. Y.
CADBY, J. N., Madison, Wis.
COONEY, E. J., Lowell, Mass.
HAWKS, A. W., Jr., Baltimore, Md.
HUMM, A. W., New York, N. Y.
LEACH, F. A., Jr., San Francisco, Cal.
POTTER, CLYDE H., Los Angeles, Cal.
PRESSANO, E. P., New York, N. Y.

Representing Affiliated Societies

BURNS, J. J., St. Louis, Mo. (Missouri)
CAMPBELL, E. C., Benton Harbor, Mich. (Michigan)
CLIFFORD, F. S., Fitchburg, Mass. (Gas Sales of N.E.)
CRONE, F. W., New York, N. Y. (Empire State G. & E.)
DEFRESE, S. E., Chattanooga, Tenn. (Southern)
ENGLISH, A. L., Council Bluffs, Iowa (Iowa)
FRANKLIN, S. J., Millville, N. J. (New Jersey)
GOULD, WM., Boston, Mass. (N. E. Gas Eng.)
JANSEN, F. A., Ottawa, Ont., Can. (Canadian)
JASPERSON, R. O., New York, N. Y. (Wisconsin)
MULHOLLAND, S. E., Fort Wayne, Ind. (Indiana)
MYRTLE, F. S., San Francisco, Cal. (Pacific Coast)
ROLSTON, R. J., Philadelphia, Pa. (Pennsylvania)
SOULES, E. E., Peoria, Ill. (Illinois)

Utica Goes After Good-Will

ON THE BOOKS of every company will be found listed such tangible assets as plant building, machinery, and so on. Another item, not so frequently included in balance-sheets, is good-will, which is exceedingly intangible, but at the same time of tremendous importance. In fact, with some companies "mental property," or good-will, is considered to be of as great value as any of the other listed assets.

In the case of public utilities, good-will is particularly important. The lack of it has been the main stumbling block in the path of the utilities. The public utilities are fully cognizant of the situation. Yet, surprisingly little has been attempted, advertisingly, to correct matters.

For example, during the month of July, last year, the secretary of the Empire State Gas & Electric Association clipped from 230 daily and weekly New York newspapers the advertisements of gas and electric companies. These were arranged under four classifications in accordance with the nature of the copy appeal. The tabulation showed the following result:

Appliance Advertising	256
Securities Advertising	77
Service Advertising	48
Special Campaign Advertising	41

In other words, scarcely any of the campaigns run by New York State gas and electric companies were designed to build good-will. Yet, unless the public utility company possesses the good-will of its customers, appliance advertising or security selling campaigns will not be so effective as they would be were the groundwork better prepared. That would not be worthy of more than passing notice if the relations of the average public utility with its customers were of the friendly sort. Unfortunately, as we mentioned previously, exactly the opposite is the case. In only isolated cases

The High Cost of Fairness

QUITE a bit more work is involved in billing your monthly Gas and Electric Service, than one would suppose.

That each bill may be absolutely accurate, our Billing Department checks your meter readings for this month against your consumption of last month and the same month a year ago. All abnormal increases are brought to light; and before we send your bill, we want to be sure you have actually used this amount.

To determine this fact, we make a second meter reading in all such cases. Perhaps you haven't used any more gas or electricity this month than you did last month, and the first reading is incorrect. It's possible you have used more than last month because of sickness, weather, company, or other causes. In either case that is what we want to know, and usually the second reading gives us the facts that explain the first reading.

Sometimes, the second reading agrees with the first, and no satisfactory reason is found for the increase. Then an expert is sent to your home to test and inspect the meter. If faulty, it is repaired or a new meter is immediately installed. Your bill is then rendered on the basis of your average monthly consumption.

In the same manner, we investigate all unusual decreases for the month. These may result from extended absence from home, installation of efficient appliances, the weather, or occasionally a faulty meter.

We make an average of 600 special or second readings every month. Usually less than 150 of these readings are the result of consumer's request, leaving 450 or better each month that this company starts of its own free will.

This is done simply because we have no desire to overcharge and wish to eliminate all inaccuracies. We seek to be absolutely fair to you in all our dealings and accuracy is the safest, surest way to secure fairness. It's a little thing that truly means much.

Utica Gas & Electric Co.

have the utilities succeeded in maintaining satisfactory relations with the public.

Occasionally, this ill-will has been caused by faulty management or improper service. More often, though, the cause is the absence of personal contact. The corporation is viewed as a large, impersonal machine. "Coldblooded" is the descriptive phrase frequently applied. And this attitude has been fostered by politicians and others with axes to grind.

When the Utica Gas & Electric Company, Utica, N. Y., first gave thought to advertising, these factors received careful consideration. The company had gone through a change in management. Over $3,000,000 had been expended in rehabilitating and extending plants. The entire system of distribution had been revamped for the purpose of giving customers better electricity and gas. Finally, special attention had been directed toward educating the company's employees on the idea of service and the thought that the consumer is always right and must be pleased at all costs.

This record of accomplishment was broadcasted by word of mouth. It was soon found, however, that the general public had not changed its conception of the company and did not appreciate the improvements. Consequently, about four months ago, a newspaper campaign was decided on. The services of an advertising agency were secured. After a careful study of the plant, its service and record, the copy was written from the viewpoint and in the language of the man in the street. The programme called for insertions, once a week, in a list of fourteen newspapers.

According to W. J. Reagan, commercial manager of the company, good-will advertising should not be lightly undertaken. In this connection he said: "Good-will advertising cannot accomplish its purpose unless it is:

"1. Founded upon an honest intention to give the best service possible.

"2. Undertaken in a big enough way commensurate with the size of the company, the size of the audience and the problems and conditions prevalent in the company's locality.

"3. Planned to run continuously.

"It takes a long time to overcome prejudice," Mr. Reagan continued. "The same message must be hammered home many times before it sinks in. Furthermore, the public forgets facts more quickly than prejudices. That is why I say sporadic advertising will not do.

"Continuity is an absolute essential in good-will advertising."

The Utica company's campaign began with a clear statement of what the future messages were to say. The remainder of the advertising then elaborated on these points. For example, one piece of copy tells what happens "when you press the button." It is pointed out that over seventeen million dollars' worth of property is at the command of a finger touch. Another advertisement explains how the company prepares for sudden demands on its service. "Twenty thousand extra baths on Saturday night means more gas for hot water. To us it means planning and preparation in advance. It is our duty to know household practice and human habits."

Then there were two advertisements, one explaining how to read a gas meter and the other how to read the electric meter. Another piece of copy told how to adjust the gas burner so that the greatest amount of heat may be secured.

Other advertisements explained what would happen were electric power cut off for twenty-four hours; exposed the

fellow who is a chronic kicker; advocated economies in the use of the gas range and electric appliances and told why well-lighted streets are so necessary to a city's growth.

In addition, the company is carrying on a customer-ownership campaign with the advertising appearing regularly in the local newspapers. These advertisements are so arranged that a single issue of the paper will not carry both goodwill and security copy.

From the campaign's inception the company has been favored with many spontaneous expressions of approval. The copy has created an atmosphere of interested expectancy as to what feature of this "taken-for-granted" industry will next be revealed. The public has welcomed the changed attitude of the company and has indicated that it is glad to know what has been accomplished and what is planned for the future.

In fact, so well pleased is the company with its first four months of advertising that a new campaign is now in preparation to cover a like period.—*Printer's Ink.*

Lessons Learned in a Slogan Contest

THE EMPIRE State Gas and Electric Association has recently completed a slogan contest in which twenty-seven companies participated by running an advertisement in their local papers, resulting in the receipt of 3,500 slogans and 600 statements.

The prize winning gas slogans were:

"We Can Figure the Cost But Not the Value"

"Gas—Saves and Serves"

"Use Gas—Of Maximum Usefulness at Minimum Cost"

"If Time Is Money Use Gas"

"The contest demonstrated the extent that newspaper advertising is read," states the Committee in charge of the contest. "It also demonstrated that the public appreciates the value of gas and electric service but that it measures this value in terms of convenience, labor saving and comfort and has given little thought to the money value of these units. Future advertising should strive to indicate that convenience, labor saving and comfort have a money value so that the customer will compare in terms of dollars, what he pays and what he receives in return. As will be noticed, the Committee had this thought in mind when judging the slogans submitted.

"In the opinion of the committee the contest was well worth while, particularly to the companies which participated but also indirectly to the industry generally. We are all of us prone to take for granted such things as gas and electric service. We never think of them except in terms of what we have to pay or in annoyance when, for some reason, they are not available when wanted. The contest, on the other hand, caused people to think of what they received rather than of what they paid and to forget any defects of the service and remember only its merits. This is very evident from the replies received and it should be remembered that many times the number who replied read the advertisements and doubtless experienced the same reaction."

LIVE LESSON MATERIAL

INTERESTING LESSON OUTLINES ON GAS INDUSTRY AVAILABLE WITHOUT COST TO YOU

Teachers! Here's something that will interest your classes in **Physics, Chemistry, General Science, Home Economics, Oral English, English Composition, Debate, Economics and Community Civics.** Make your teaching easier, more interesting and useful by getting this material.

The Demand For Modernity:

It is becoming increasingly important that children be taught the facts of modern life. All educators agree on this point. True, they know much of the culture of the past. But it must not be taught to the exclusion of a knowledge of the great world of the living present. School patrons everywhere are demanding that the schools deal more in the practical present day realities.

The Need of Materials:

The knowledge of the older achievements of civilization seems to be easily accessible to the teacher. It has been collected in books. Teachers feel that they would be glad to give more attention to modern industrial life if the material were available. We are glad to announce that we are able to supply you with just the material you want.

A Modern Commodity:

Let us suggest the feasibility of a project study on The Use of Gas. What an important part gas plays in modern life! You study it in your science classes. You use it in your laboratories. Gas is used to inflate balloons, to heat, light and cook with, for welding, and for many other industrial purposes.

Test with these Questions:

Do your pupils know the facts about gas? If not, they should. Heat or illumination, instantly accessible, constantly equable and uniform in operation, are accessories made possible through gas, and were unknown until modern times. How is gas made? How is it conducted to the home? What makes it come when the gas cock is opened? How many kinds of gas are there? What does it cost? How is it measured? How is it shipped? Why is gas the best fuel for cooking purposes? Why is it better to have one gas plant in a community, where all may get their fuel, than for each home to furnish its own?

Interesting Project Hints:

Literature written by those who know, on the subject of gas, its uses, etc., has been made available to the schools through the Committee on Public Utilities. Such literature on the common things of our uncommon modern life is just what we have been looking for. It can be used for field or project lessons in our classes in hygiene, community civics, English, general science, physics, chemistry, domestic science, general science. We believe it will motivate class work and that the interest growing out of the discussion of this essential commodity will reach the entire community.

A very interesting booklet, together with suitable outlines, will be sent to you in sufficient numbers for your classes if you will but send us the coupon below.

USE THIS COUPON

Committee on Public Utility Information, 507 Bankers Life Building, Lincoln, Nebr.

Gentlemen: I am interested in the above material. Please send, without obligation,

.....copies of Booklet entitled, The History and Development of the Gas Industry,

and outlines for use in my classes in (a)..... (No.)..... (b).....

(No.)..... (c)..... (No.)..... (d)..... (No.).....

Name ..... Teacher in.....

Address .....

Nebraska's Unique Educational Work

HORACE M. DAVIS, director of the Nebraska Committee on Public Utility Information, has hit upon an educational project which is meeting with greater success than he at first anticipated. How to get information on the gas business and other utilities in the hands of school children during class hours was the chief problem that faced Mr. Davis.

There was already available for distribution to teachers and school children the excellent booklet entitled, "History and Development of the Gas Industry," written by Hal Lytle of the Illinois Committee. Mr. Davis figured that if he could get the teachers interested in this booklet and have them use it for class work, his main objective would be accomplished.

A full page advertisement was placed in The Nebraska Educational Journal, which reaches practically every teacher and school official in the state, and soon thereafter the demand of the booklet exceeded the supply. Outlines for suggestive courses of study in the various classes were then prepared by a recognized educator and were furnished through the State Teachers' Association. At the present time the project has developed to the point where the instructors in the various schools, principally where there are gas plants, carefully examine the note books of the pupils and certify to the Nebraska Committee on Public Utility Information the names of the students who have done good work and to such are issued "Certificates of Efficiency."

"The letters and inquiries that are coming in lead to the conclusion that the idea has taken root and is a success," says Mr. Davis. "We assume that all plant managers will cooperate with the school instructors to make the campaign mutually profitable."

Don't Miss This Opportunity

FROM TEN to fifteen thousand advertising men—the cream of the advertising profession in the United States, Canada and Europe—will attend the convention of the Associated Advertising Clubs of the World at Atlantic City, in June. Coincident with this big convention there will also be held the first convention of the newly organized Public Utilities Advertising Association and the first exhibition of gas, central station, street railway and telephone company advertising.

We are already collecting gas company and manufacturer company advertisements, including posters, show cards, booklets, folders, etc., for the gas exhibit. But we haven't got nearly enough samples to make a representative display—one that will do credit to our industry.

Send proofs and samples of your best advertising work to American Gas Association headquarters and we will turn them over to E. J. Cooney, a member of the Managing Committee of the Publicity and Advertising Section, who has charge of the exhibition.

The convention is to be held June 4 to 8. It is the opportunity of a lifetime to let the world know about your advertising.

Income and Expense Statement

Year 1922

The following is a statement of the income and expenses of the Consolidated Gas Electric Light and Power Company of Baltimore, for the year ending December 31, 1922.

Gross Income from Electric Sales..... (This was the amount billed for electricity to 107,202 customers.)		$11,800,904.84
Gross Income from Gas Sales..... (This was the amount billed for gas to 159,720 customers.)		8,120,049.96
Miscellaneous Income..... (This includes interest on money deposited in banks, profits from the sale of merchandise including gas and electric appliances, and sundry items of income.)		455,129.38
Total Gross Income..... (Total of the three preceding amounts.)		$20,376,084.18
Operating Expenses..... (This covers all expenses involved in the operations of the Company, including wages, coal, oil, materials, repairs, purchased gas, purchased electricity, billing, accounting, collecting, etc., except charges for depreciation—renewals.) *Includes no interest or return on capital.*	$9,777,671.90	
Taxes..... (This was the amount paid during the year 1922 to the City of Baltimore, the State of Maryland, the several counties of the State, and the Federal Government, for taxes of all kinds.)	1,674,054.94	
Operating Expenses and Taxes.....		11,451,726.84
Net Earnings..... (This was the amount which remained after paying operating expenses and taxes, as above.)		$ 8,924,357.34
Fixed Charges..... (This amount covers interest paid on Bonds owned by thousands of investors residing in Baltimore and elsewhere, issued for money used in building and equipping a part of the plants and distributing systems for gas and electric service to the people of Baltimore and vicinity.)		3,405,688.19
Net Income..... (This is the balance that remained after paying operating expenses (not including depreciation—renewals), taxes, and fixed charges, as above.)		$ 5,518,669.15

Income and Expense Statement—Continued

Brought forward.....		$ 5,518,669.15
Dividends.....		1,599,246.46
(This is the amount of dividends paid to stockholders (owners) of the Company, who numbered 10,376 at December 31, 1922. The regular 8% dividend was paid on the common stock, and the required dividends on the preferred stock, viz., 8% on Series "A" and 7% on Series "B".)		
Gross Surplus.....		$ 3,919,422.69
(This amount remained after paying operating expenses, taxes, fixed charges and dividends.)		
Reserve for Depreciation (Renewals).....		1,345,000.00
(This amount was set aside as a Reserve to defray the cost of replacing property when withdrawn from service on account of obsolescence, inadequacy, or from any other cause. This is an operating expense.)		
Surplus for the year.....		$ 2,574,422.69
(This amount remained after providing for operating expenses, taxes, fixed charges, dividends and depreciation—renewals.)		
Additions to Surplus.....$	5,178.79	
(This is the amount of miscellaneous income collected during the year 1922, due on prior years' operations.)		
Deduction from Surplus.....	20,675.59	
(This covers miscellaneous charges paid during the year 1922, incurred during prior years.)		
Amortization of Premium and Discount on First Refunding Mortgage Series "B" 7½% Bonds Redeemed December 1, 1922....	925,621.30	
(This covers the charges in connection with a bond issue retired and the substituting of a new issue of like amount at a lower interest rate for the purpose of saving interest of approximately $100,000 per year for 23 years.)		
Sinking Fund Accrual.....	111,458.33	
(This sum was set aside toward the gradual retirement of First Refunding Mortgage Bonds.)		
Total Net Deductions from Surplus.....		1,052,576.43
Net Increase in Corporate Surplus for the year....		$ 1,521,846.26
(This amount was transferred to the general surplus account for investment or other use, for the benefit of the business and its stockholders.)		

A Remarkable Year Book

LAST MONTH in these pages we described the ambitious newspaper advertising program of the Consolidated Gas, Electric Light and Power Company of Baltimore. Since then the company has issued its 1922 Year Book—a book in a class by itself, so far as year books go, and one which could well serve as a model for other public utility companies to emulate. Arthur W. Hawks, Jr., a member of the Managing Committee of this Section, is editor of the book and how well he has done his job is illustrated by a double column article in the Baltimore News entitled, "Power Company Gives Full Information to Shareholders." Part of the article is reproduced here:

"The average annual report is unintelligible to the rank and file of stockholders. They study the figures sometimes, and when they finish they know about as much of the condition of the property the report deals with as they did before. This confusion is obviated in the Gas and Electric Year Book.

"There are nearly 7,000 residents of Baltimore and vicinity who own nearly a majority of the shares of stock in the company. Over a thousand of these are employees of the corporation, and by far the greater number own from 1 to 10 shares. They have just as much right to know the true condition of the company as have the men who sit on the board of directors, or those who own big blocks of the utility's stock. The management recognizes this right; hence the publication of the Year Book.

"It was in 1910 when J. E. Aldred and associates acquired control of the Gas and Electric Company. One of Mr. Aldred's first moves was to win the confidence of the public and he set out to accomplish this by placing his cards on the table face up. It was not an easy task to change the view of the public toward corporations. The people were suspicious of everything which bore the stamp 'corporation', and when the campaign was launched to 'educate the public' to the fact that there was such a thing as a corporation playing fair, it was met with sneers on the part of the unthinking.

"Gradually the truth began to dawn upon the people and today probably no utility corporation in the United States has succeeded in establishing stronger relations with the people it serves than has the Gas and Electric Company. Customer ownership of the Gas and Electric Company also was hit upon by Mr. Aldred and his associates in the management of the company as a means of strengthening the good relations between the company and the public, and the fact that nearly 7,000 patrons of the company are enrolled as stockholders is the answer whether the plan has been successful."

Growing Fast

On March 10th, 215 advertising men in the public utility business had joined the Public Utilities Advertising Association, the new official department of the Associated Advertising Clubs of the World. Membership dues are $5.00 a year. Write this office for application card and take out a membership in the name of your company.

Associations Affiliated with A. G. A.

Canadian Gas Association
Date of Affiliation—Mar. 25, 1919
Pres.—Col. D. R. Street, Ottawa Gas Co., Ottawa, Ont., Can.
Acting Sec.-Tr.—E. A. Hills, Consumers' Gas Co., Toronto.
Conv., 1923.

Empire State Gas and Electric Association
Date of Affiliation—Nov. 21, 1919
Pres.—M. J. Brayton, Utica Gas & Electric Co., Utica, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., 1923.

Illinois Gas Association
Date of Affiliation—Mar. 19, 1919
Pres.—R. S. Wallace, Central Illinois Light Co., Peoria, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., 1924.

Indiana Gas Association
Date of Affiliation—April 24, 1919
Pres.—F. B. Tracy, Central Indiana Gas Co., Muncie, Ind.
Sec.-Tr.—E. J. Burke, Citizens Gas Co., Indianapolis, Ind.
Conv., West Baden Springs Hotel, West Baden, Ind., May 7, 8, 1923.

Iowa District Gas Association
Date of Affiliation—May 21, 1919
Pres.—H. B. Maynard, Citizens Gas & Electric Co., Waterloo, Ia.
Sec.-Tr.—H. R. Sterrett, Des Moines Gas Co., Des Moines, Ia.
Conv., Hanford Hotel, Mason City, April 18, 19, 20, 1923.

Michigan Gas Association
Date of Affiliation—Sept. 18, 1919
Pres.—Fred W. Seymour, Battle Creek Gas Co., Battle Creek, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., 1923.

Missouri Association of Public Utilities
Date of Affiliation—June 18, 1920
Pres.—E. R. Locke, Missouri Utilities Co., Mexico, Missouri.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Wiley F. Corl, Chmm. Affiliation Com., Missouri Utilities Co., Mexico, Mo.
Conv., 1923.

New England Association of Gas Engineers
Date of Affiliation—Feb. 19, 1919
Pres.—C. E. Paige, C. H. Tenney & Co., Boston, Mass.
Sec.-Tr.—J. L. Tudbury, Salem Gas Light Co., Salem, Mass.
Conv., Boston, 1923.

Gas Sales Association of New England
Date of Affiliation—Oct. 1, 1919
Gov.—F. A. Woodhead, Arlington Gas Light Co., Arlington, Mass.
Sec.—M. Bernard Webber, 150 Congress St., Boston, Mass.
Annual Meeting, 1923.

New Jersey Gas Association
Date of Affiliation—April 25, 1919
Pres.—Jacob B. Jones, Bridgeton Gas Light Co., Bridgeton, N. J.
Sec.-Tr.—H. E. Mason, Consolidated Gas Co. of N. J., Long Branch, N. J.
Conv., Hotel Bellvue Stratford, Philadelphia, Pa., April 11, 12, 13.

Pacific Coast Gas Association
Date of Affiliation—Sept. 18, 1919
Pres.—F. S. Wade, Southern Counties Gas Co., Los Angeles, Cal.
Sec.-Tr.—W. M. Henderson, 812 Howard St., San Francisco, Cal.
Conv., Del Monte, Cal., Sept. 11-14.

Pennsylvania Gas Association
Date of Affiliation—April 10, 1919
Pres.—Luther Gaston, Lebanon Gas & Fuel Co., Lebanon, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., Hotel Bellvue Stratford, Philadelphia, Pa., April 11, 12, 13.

South Central Gas Association
Date of Affiliation—Oct. 15, 1919
Pres.—F. C. Armbruster, Southwestern Gas & Electric Co., Shreveport, La.
Sec.-Tr.—S. J. Ballinger, San Antonio Public Service Co., San Antonio, Texas.
Conv., 1923.

Southern Gas Association
Date of Affiliation—May 20, 1919
Pres.-P. H. Gadsden, The United Gas Improvement Co., Philadelphia, Pa.
Sec.-Tr.—G. H. Smith, City Gas Co., Norfolk, Va.
Conv., St. Petersburg, Fla., April 16-18, 1923.

Wisconsin Utilities Association
Pres.—J. P. Pulliam, Wisconsin Public Service Co., Milwaukee, Wis.
Exec.-Sec.—J. N. Cadby, 445 Washington Bldg., Madison, Wis.
Conv., 1924.

Correction—Service Letter No. 40

Through an error on our printer's part, Service Letter No. 40 was dated February, 1922, instead of February, 1923. We regret this mistake, but since the mailing of these letters is done out of town, we had no opporunity to correct this error.

MANUFACTURERS SECTION

F. A. LEMKE, Chairman — G. W. PARKER, Vice-Chairman

C. W. BERGHORN, Jr., Secretary

MANAGING COMMITTEE—1923

At Large

BAILEY, JR., E. P., Cleveland, Ohio
COLLINS, D. J., Philadelphia, Pa.
CRANE, WM. M., New York, N. Y.
DE HART, JR., J. S., Newark, N. J.
DICKEY, E. S., Baltimore, Md.
GREENE, J. J., New York, N. Y.
KNAPP, F. H., Pittsburgh, Pa.
MAXON, H. R., Muncie, Ind.
MCDONALD, DONALD, New York, N. Y.
NORMAN, E. A., New York, N. Y.
ROBERTS, EARL W., Detroit, Mich.
SIMLER, O. P., Lorain, Ohio
STITES, TOWNSEND, Gloucester, N. J.
TAPPAN, W. H., Mansfield, Ohio.

Representing Affiliated Societies

ABBOTT, M. E., Taunton, Mass. (Gas Sales of N. E.)
BARTLETT, C. E., Philadelphia, Pa. (New Jersey)
BARTLETT, C. E., Philadelphia, Pa. (Pennsylvania)
CARVISTON, A. L., Baltimore, Md. (Southern)
GIBSON, W. R., Toronto, Ont., Can. (Canadian)
HAMMOND, E. W., San Francisco, Cal. (Pacific Coast)
MCCULLOCH, CHARLES, Milwaukee, Wisc. (Wisconsin)
NORTON, ARTHUR E., Boston, Mass. (N. E. Gas Eng.)
PARKER, JOHN F., Rockford, Ill. (Indiana)
ROPER, GEO. D., Rockford, Ill. (Illinois)
ROPER, GEO. D., Rockford, Ill. (Iowa)
SHIDENGLAND, C. H., Dallas, Texas (South Central)
SMITH, W. L., Battle Creek, Mich. (Michigan)

CHAIRMEN OF SECTION COMMITTEES ORGANIZED TO DATE

Exhibition—F. A. LEMKE, Kalamazoo, Mich.
Nominating—J. S. DEHART, JR., Newark, N. J.
Division of Accessories Manufacturers—EARL W. ROBERTS, Detroit, Mich.
Division of Apparatus & Works Manufacturers—D. J. COLLINS, Philadelphia, Pa.
Division of Gas Range Manufacturers—W. H. TAPPAN, Mansfield, Ohio.
Division of Heating Appliance Manufacturers—E. P. BAILEY, JR., Cleveland, Ohio.
Division of Industrial Appliance Manufacturers—H. R. MAXON, Muncie, Ind.
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Division of Meter Manufacturers—DONALD MCDONALD, New York, N. Y.
Division of Office Labor Saving Devices—E. A. NORMAN, New York, N. Y.
Division of Water Heater Manufacturers—O. P. SIMLER, Lorain, Ohio.
Division of Supply Manufacturers—J. J. GREENE, New York, N. Y.

A. G. A. Specifications Should Be Your Specifications

The following article appeared in the monthly paper gotten out by one of our manufacturer members. Since its circulation reaches such places as department stores, hardware stores, appliance stores, etc., they are to be more than congratulated for their expounding of the doctrine of the A. G. A. Specifications. This is the right sort of cooperation—the kind that will bring results. (EDITOR'S NOTE.)

MOST OF US know that "A. G. A." stands for the American Gas Association. But do we all really appreciate that the "specifications" for gas ranges and appliances, authorized by this association are primarily designed for the benefit of the merchant, and his customer?

This will be clear to all who remember that the American Gas Association is first of all interested in making and selling gas, but is broad minded enough to realize that its problem of selling gas is much simplified, and its customers kept satisfied, if the gas is used in a sturdy, long-lived, efficiently designed appliance.

To that end, the "Committee on Standardization of Gas Appliance Specifications" appointed by the officers of the Association, includes engineers who have spent most of their lives in the gas business, merchandisers who have country-wide reputations for successfully selling large quantities of gas appliances, and manufacturers who have always been noted for the high quality of their product. Does not the personnel of this committee insure that their specifications are correct from an engineering standpoint; that the requirements of the consumer, your customer, are met, and that the best manufacturing practices are followed?

Every Point Thoroughly Covered

As printed, the specifications comprise an eighteen-page booklet, 8½" x 5½". Just to give you an idea of how carefully each part and feature of a range is treated, we quote the following from this book:

"Baking and broiling ovens to be furnished with linings to provide air space insulation to the ovens at sides and back. Where used for insulation solely, there is to be not less than ¼" dead air space. Baking oven to be furnished with a top lining, providing not less than ½" space."

"It should be possible to fully observe the baking oven burner flames without opening either the baking or broiling oven doors."

"The outside parts of the tops of ovens on elevated and cabinet types of ranges, if of sheet steel, to be not less than No. 20 gauge."

"Rack supports, when made of sheet metal, to be not less than No. 26 gauge, and to be made of channel construction to prevent racks from tilting when partially withdrawn."

"The flue collar to be of cast iron, or if sheet steel, to be not less than No. 20 gauge. Collar for flue connection to be on top of range and to be so ventilated that the placing of a vessel over the collar will not prevent the oven products from escaping."

"Top burners to be cored castings and not to have any loose parts. The gas outlets to be drilled ports. No cone spreaders to be used. The distance between the tops of the burners and the bottom of a vessel placed on the top grates to be not less than 1¼ inches, nor more than 1½ inches."

"Cocks and valves are to be tested and required to remain tight and free from leaks under an air pressure of three pounds per square inch. Test to be made with cocks submerged in shallow water."

"Manifolds to be not less than ¾" extra heavy wrought iron or steel pipe and all ends to be carefully reamed on the inside to remove the obstruction or burr caused by cutting."

"Manifolds not to be constructed of bent pipe. Manifold supports to be of split type instead of solid pattern."

These quotations are, of course, only a small part of the specifications, but we trust will make clear our point that a carefully chosen standard is set up for each detail of the range.

Compare Ranges First by This Standard

It would not be practical for you and your fellow merchants, each to have his own engineering department to test and approve various appliances that interest you from a merchandising viewpoint. Fortunately, this problem in the case of gas ranges, has been handled for you. Ask first if the range presented for your approval and purchase, is built in strict accordance with A. G. A. Specifications.

(Continued on page 255.)

COMMERCIAL SECTION

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Retail Pricing—A. P. POST, Philadelphia, Pa.
Sales Stimulation—J. E. DAVIES, Chicago, Ill.

Prizes for the Companies Making the Best Records of Appliance Sales Per Meter

THE EXECUTIVE Board has approved the recommendation of the Commercial Section to award suitable prizes to the member gas companies making the most creditable performance in appliance sales per meter covering the period September, 1922, to August, 1923, inclusive.

Data blanks have been furnished to the member companies on which the records of appliance sales may be reported monthly to the Association headquarters. Additional blanks will be supplied on request.

There will be four prizes awarded at the 1923 Convention, two awards in each group of northern and southern companies. Just what these prizes will be has not yet been determined; they will, however, be some suitable recognition to the companies having the largest dollar appliance sales per meter for the twelve months ending August, 1923.

The standing of the first ten companies in each group for the last four months of 1922 is shown in the accompanying tables. A study of these results will dis-

close a wide difference in the appliance sales per meter of these companies, which difference is still further marked from the reports of several hundred other companies.

It is hoped that the results achieved by the leading companies will be an incentive for other companies and help to establish some standard of appliance sales per meter performance towards which every member company of the Association will strive.

How do the results in your Company compare with the companies listed below?

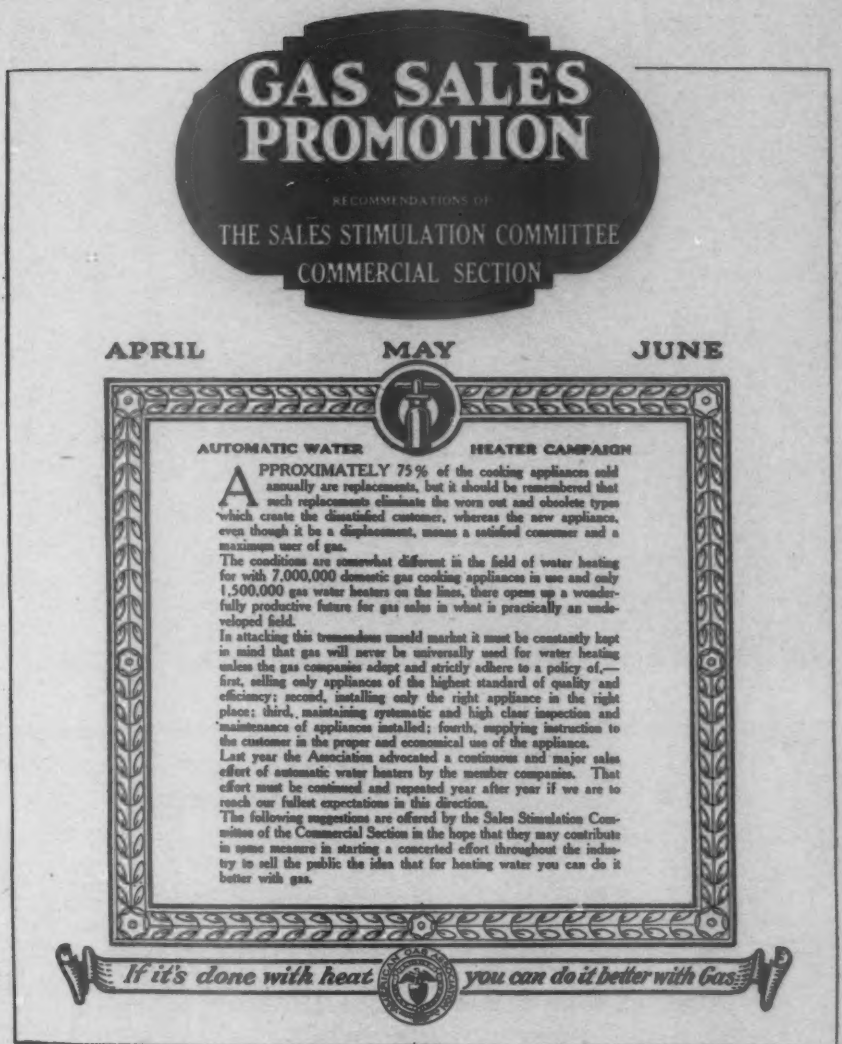
No.	Company	Location	Meters	Average $ Appliance Sales Per Month
	Northern Companies			
1.	Lexington Gas Co.,	Lexington, Mass.	559	$1.47
2.	Wisconsin Valley Electric Co.,	Stevens Point, Wis.	1030	1.32
3.	North Shore Gas Co.,	Waukegan, Ill.	14308	1.30
4.	Madison Gas & Electric Co.,	Madison, Wis.	10580	1.17
5.	Lebanon Gas Co.,	Lebanon, Pa.	1165	1.13
6.	Arlington Gas Light Co.,	Arlington, Mass.	9078	.98
7.	Public Service Gas Co.,	Princeton, N. J.	1482	.89
8.	Freeport Gas Co.,	Freeport, Ill.	5140	.78
9.	Ottumwa Gas Co.,	Ottumwa, Ia.	4427	.75
10.	Northampton Gas Light Co.,	Northampton, Mass.	4179	.73
	Southern Companies			
1.	Rocky Mount Public Works,	Rocky Mount, N. C.	2307	1.71
2.	Columbus Electric & Power Co.,	Columbus, Ga.	2661	1.53
3.	Southern Public Utility Co.,	Charlotte, N. C.	4838	1.51
4.	Jacksonville Gas. Co.,	Jacksonville, Fla.	12770	1.29
5.	Tampa Gas Co.,	Tampa, Fla.	8445	1.13
6.	Roanoke Gas Light Co.,	Roanoke, Va.	6259	.92
7.	Knoxville Gas Co.,	Knoxville, Tenn.	4538	.76
8.	El Paso Gas Co.,	El Paso, Tex.	11868	.68
9.	Pensacola Gas Co.,	Pensacola, Fla.	3282	.64
10.	Gas Light Co. of Augusta,	Augusta, Ga.	5590	.44

For Those Companies Interested in Outdoor Gas Lighting

"The Lighting of Our Streets" is the title of Bulletin No. 106 just issued by the British Commercial Gas Association, offices 30, Grosvenor Gardens, London, S. W. 1.

This Bulletin contains illustrations of many gas street lighting installations which are described in detail.

Requests for this Bulletin should be made direct to the B. C. G. A.


GAS SALES PROMOTION
RECOMMENDATIONS OF
THE SALES STIMULATION COMMITTEE
COMMERCIAL SECTION
APRIL
MAY
JUNE
AUTOMATIC WATER HEATER CAMPAIGN
APPROXIMATELY 75% of the cooking appliances sold annually are replacements, but it should be remembered that such replacements eliminate the worn out and obsolete types which create the dissatisfied customer, whereas the new appliance, even though it be a displacement, means a satisfied consumer and a maximum user of gas.
The conditions are somewhat different in the field of water heating for with 7,000,000 domestic gas cooking appliances in use and only 1,500,000 gas water heaters on the lines, there opens up a wonderfully productive future for gas sales in what is practically an undeveloped field.
In attacking this tremendous unsold market it must be constantly kept in mind that gas will never be universally used for water heating unless the gas companies adopt and strictly adhere to a policy of,—first, selling only appliances of the highest standard of quality and efficiency; second, installing only the right appliance in the right place; third, maintaining systematic and high class inspection and maintenance of appliances installed; fourth, supplying instruction to the customer in the proper and economical use of the appliance.
Last year the Association advocated a continuous and major sales effort of automatic water heaters by the member companies. That effort must be continued and repeated year after year if we are to reach our fullest expectations in this direction.
The following suggestions are offered by the Sales Stimulation Committee of the Commercial Section in the hope that they may contribute in some measure in starting a concerted effort throughout the industry to sell the public the idea that for heating water you can do it better with gas.
If it's done with heat
you can do it better with Gas

Sales Managers:—

This is the cover page of the latest Special Sales Bulletin on gas water heating. The suggestions made in this Bulletin by our Sales Stimulation Committee will help you sell your customers the idea that for heating water you can do it better with gas.

This is a plan for an intensive cooperative movement of the entire industry to sell this big undeveloped field.

A copy of this Bulletin will be sent on receipt of your request.

Efficient Method for Heating Cleaning Tanks

The above illustration shows an up-to-date method of heating cleaning vats and tanks. It is very efficient, quick in heating up, safe, easily cleaned and maintained in perfect working order; can easily be adapted to existing tanks and vats. Where grease-covered metal parts must be cleaned, it is a most suitable method of heating as there is plenty of space for the dislodged grease to settle without coating the heating surface and thus reducing the efficiency.

Tests on this installation showed an efficiency of 86% when heating up. Daily consumption about 2500 cu. ft. with a maximum gas demand of 450 cu. ft. per hr.

For more detailed information apply to A. G. A. Headquarters.

Cotton Yarn Singeing

THE SINGEING of cotton yarn by carriage type cotton yarn singeing machines as described and shown in the illustrations herewith is an excellent example of the application of gas to this branch of the cotton goods manufacturing industry.

The machines are 6 burner carriage type machines, the burners being slotted, atmospheric and about 4' 6" long. They are mounted on the movable carriage and the gas connection is flexible.

The carriage is counter-balanced with heavy weights as shown in Fig. 1 and so arranged that when it is lowered by means of the operating handle, the motor which draws the yarn is disconnected and the gas is turned down. Each two burners are controlled by a large globe valve shown in the illustration. The valve shown under the carriage shuts off the gas from the whole machine.

The yarn is drawn through the reeds and over the burners at a speed varying from 50 to 100 feet per minute according to the size and character of the yarn, the larger sizes running at lower speeds. The gas consumption also varies with the size of the yarn processed.

As shown in Fig. 1, the machine is in actual operation, the yarn is in motion and the gas flames are rather indistinctly shown as light streaks across the surface of the yarn between the reed racks.

Fig. 2 gives more complete details of the burner and the method of application of the flame. The gas supply and two of the globe valve controls are shown in this illustration as is also the crank by which the carriage is raised and lowered. This is in the lower right-hand corner.

Further details on this installation may be secured by applying to Association headquarters.

Fig. 1

Fig. 2

Mother Goose Up-to-Date

John N. Cadby, Secretary of the Wisconsin Utilities Association, has been in telepathic communication with Mother Goose, with the result that the old lady has been completely sold on the public utility business and has turned out a revised edition of her rhymes.

This winter you may expect to hear something like this emanating from the nursery:

Old King Coal
Was a dirty old soul,
And a dirty old soul was he;
Along came a gas man
And baked him a while
And instead of one King
There were three.

The first was King Gas
Who cooked all the meals,
He was clean and quiet and fine.
The next was King Coke
Who warmed the house,
He was cleaner than coal
From the mine.

The last was King Tar
Who made perfume and dyes,
Beautiful things and sweet;
The three young kings
Are all the rage
Since Old King Coal's defeat.

Other rhymes are equally interesting. Sample copies of the pamphlet may be obtained from Mr. Cadby, 445 Washington Building, Madison, Wisconsin.

Making the Easter Bonnet

IN THE MANUFACTURING of ladies' hats, gas fuel is required for each heating step, employing appliances such as gas steam boilers, gas heaters, irons, hatter's stoves, etc.

As the different seasons approach, the designers are busy constructing the shapes of hats for that particular season, which will harmonize with the prevalent styles, and hundreds of designs are made up for approval of the manufacturers. After the selections are made of shapes, styles, widths of brims, etc., the models are forwarded to the moulder, who casts male and female aluminum dies enabling the hat manufacturer to make up the popular shapes in large lots.

Figure 1 shows three furnaces using gas for melting the composition which is ladled out and poured in sand moulds for casting dies. On the floor are several finished castings ready for shaping the hats under pressure.

In figure 2 can be seen a row of stamping machines in which the dies for hat shaping are placed. One half of the die is fastened to the lower part of the frame and the other half to the upper part. The straw or felt is placed over the lower half of the die, which is brought down, bringing the two dies together. The upper half of the die is

Fig. 1

Fig. 2

heated by a small perforated copper coil burner which is shaped to conform with the shape of the die. The press is then closed and left that way for a period of about two minutes, during which time pressure on the material is exerted causing the heat applied to the fabric to shape a hat according to the form of the die. This method of shaping is employed where production is required and not quality.

On the left side of the stamping machines, a hydraulic press can be seen that is used also for shaping, with the exception that a finer grade of straw or felt hat is used, and that it is heated by steam instead of direct application of heat.

The better shaping method employed in the manufacturing of hats is shown in Figure 3, where a superior type of hat is made. Instead of shaping with presses or stamping machines, the work is done by hand with a gas fired hatter's iron internally heated. As this method is slow and requires skill, it is only applied to the higher priced hats, although the process employed is simple. The operator places the straw or felt on a wooden block, and steams same to soften the material. He then works the hat into the shape of the wooden block, while the steam from a gas fired boiler is softening it, and although by looking at the photograph, it appears easy, it nevertheless requires skill on the part of the operator in thoroughly steaming the material and working every curve and angle into the design or model. After this operation, the hat is sized with a glue composition, so that it will retain

Fig. 3

its shape. A dry room heated by steam coils or indirect gas fired radiators is used for drying, before the hat is ready for trimming by the milliner.

A gas fired steam boiler is used in dyeing and finishing of feathers for hats, as shown in Figure 4. These feathers are purchased in quantities, in their original colors as taken from birds, and are washed thoroughly with warm water, before they are dyed. In lots of from single feather to tubsfull, the feathers are then dyed in tubs. The length of time required for the dyeing process depends upon the color, as, for instance, black requires from 1½ to 2 hours of a constant boil in order to get proper results, whereas the lighter colors and shades can be dyed in three or four minutes. The trade very often desire very difficult shades matched, and in order to do this, blending of different colors is employed.

Gas fired steam boilers are also used in the manufacture of artificial leaves, flowers, etc. The material used is generally linen or muslin, and is dyed, starched and strapped on a frame, which is hung up, for drying in a drying oven heated by gas.

After drying, the material is removed from the frame and petals of the flowers or the various shaped leaves are cut out by placing the material on a large wooden block similar to that of the butchers and using a steel cutter and mallet.

It can be seen that gas plays an important part in the manufacture of ladies' hats, and this class of business should be developed in all large cities. The simplicity with which the gas steam boiler operates, requiring little or almost no care of a workman, and the fact that using gas for heating permits of locating in better types and classes of buildings, eliminating the inconvenience of depending upon steam from central coal steam plants, is sufficient to bring home to the manufacturers of hats the advantages of gas in their work.

Fig. 4

Trials and Tribulations

The trials and tribulations of a meter reader are many. Many dogs bite them, many irritable housewives almost bite them and hold them personally responsible because gas bills are too high. They walk many miles in all kinds of weather. In most houses the meters are located in the basement. Often, as a meter reader prepares to descend into this sacred spot, he is greeted with such commands as, "Don't go down there today; come back tomorrow," or "Wait until I go down first," or "Don't come down until I call you." When the meter reader is then admitted to the basement he inhales an aroma that recalls the days before the name of Volstead became a household word.

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Standardization of Capacities of Consumers' Meters—WALTON FORSTALL, Philadelphia, Pa.

Sulphur Compounds Other than Hydrogen Sulphide in Gas as a Factor Governing the Selection of Gas Coals*

Data collected by J. B. Craven, Peoples Gas Light & Coke Co., Chicago, and report prepared by W. A. Dunkley, U. S. Bureau of Mines, Urbana, Ill., Members of A. G. A. Purification Committee.

THE AMOUNT of sulphur compounds, which may be permitted to remain in gas for public distribution, is limited in practically every state and city where laws or ordinances governing the gas industry are in force. In most cases the regulations prescribe that the gas shall be free from hydrogen sulphide, as determined by the lead acetate test performed in a prescribed manner and that the amount of sulphur in all other forms shall not exceed a certain maximum. This limit is 30 grains per 100 cubic feet of gas, in the following states:

Arizona	Maine
California	Maryland
Colorado	Massachusetts
Connecticut	Missouri
Illinois	Montana
Indiana	Nevada
New Jersey	New York (2nd Dist.)
North Carolina	North Dakota
Pennsylvania	Washington
Wisconsin	

In Oregon the prescribed maximum is 25 grains per 100 cu. ft.

Some cities also have municipal regulations limiting the total sulphur remaining in the gas per 100 cu. ft. as follows:

Battle Creek, Mich.	30 grains
Birmingham, Ala.	25 "
Cedar Rapids, Ia.	30 "

*Published by permission of the Director of the Bureau of Mines.

Charleston, S. C.	20	"
Chattanooga, Tenn.	20	"
Cleveland, Ohio	30	"
Des Moines, Iowa	20	"
Detroit, Mich.	30	"
Flint, Mich.	30	"
Grand Rapids, Mich.	30	"
Kalamazoo, Mich.	30	"
Lincoln, Nebr.	20	"
Los Angeles, Calif.	25	"
Mason City, Iowa	30	"
Minneapolis, Minn.	20	"
Apr. 1 to Oct. 1; rest of year	30	"
New Orleans, La.	30	"
Omaha, Nebr.	15	"
Pasadena, Calif.	25	"
Pawtucket, R. I.	20	"
Port Huron, Mich.	30	"
Roanoke, Va.	30	"
Saginaw, Mich.	30	"
San Diego, Calif.	25	"
Sioux City, Iowa	20	"
Apr. 1 to Oct. 1; other times	30	"
Sioux Falls, S. Dakota	30	"

The purpose of the present investigation was to learn if possible, about how much leeway our present gas manufacturing processes permit, with the coals now used. We know from past experience, just about to what degree purification costs will be increased with increased content of H_2S in the gas, but, since the other forms of sulphur are not removed from the gas and we have no cheap and simple means of removing them, they seem at the present time to set the limit with respect to sulphur content for coals to be used.

It was also desired to determine, if possible, whether oxide purifiers as now used materially reduce the amount of these fixed sulphur compounds in the gas. It has been stated in the literature of gas purification that the free sulphur present in fouled oxide is capable to an appreciable extent, of removing carbon disulphide from gas and it was desired to learn whether the amount of this sulphur compound thus removed was at all considerable under usual operating conditions.

A questionnaire was sent out to several gas and coke oven companies requesting the following information:

1. What is the total sulphur content of your crude gas?
   What is the H_2S content?
2. What is the total sulphur content of your purified gas?
3. What kind of purifying material do you use?
4. What method of revivification do you employ?
5. What is the average percentage of sulphur in your described oxide?
6. What method do you use for determining total sulphur in the gas?
7. What is the sulphur content of your gas coal or water gas generator fuel?

Replies were received from most of the companies to whom the questionnaire was sent, but most of them were not in position to give the information sought with respect to the first question, namely, the amount of total sulphur and the amount of hydrogen sulphide in the unpurified gas. It was stated in nearly every case that no total sulphur tests were made on unpurified gas. We were not successful, therefore, in getting much accurate information regarding the amount of sulphur compounds other than H_2S removed by the purifiers. In a single coke oven plant in which separate tests were made, it was reported that the average amount of H_2S in the unpurified gas over a period of three months was 181 grains per 100 cu. ft. and 5 grains in the purified gas. The carbon disulphide in the unpurified gas was reported as 9 grains and that in the purified gas as 1 grain per 100 cu. ft. In this case there was an apparent removal of 8 grains or 88 per cent; but whether tests were taken with sufficient frequency, so that this actually represented the state of affairs is uncertain.

Another plant reported 20.7 grains of sulphur other than H_2S ahead of the purifiers and 18.2 grains after the purifiers. In the coke oven gas purified at the same plant, 9.1 grains were re-

ported at the inlet of the purifiers and 7.0 grains after the purifiers. In the first case the removal was 12 per cent and in the second case, 23 per cent. While the above figures alone would hardly be sufficient to establish a definite rule, it seems that under certain conditions the oxide purifiers do remove some of the sulphur compounds other than H_2S. The amount removed probably depends upon the amount of free sulphur present in the mass.

The information obtained from the replies to the questionnaire, while somewhat incomplete is summarized in the following table:

From this table, somewhat incomplete though it is, a few conclusions can be drawn. In the first place, it appears that the total sulphur content of the purified gas is not now a limiting factor in the choice of coal. Coals which yield up to 600 grains of H_2S per 100 cu. ft. in the gas do not in any of the cases studied, yield much more than one-half of the total sulphur maximum to the purified gas.

There is no well defined relation between the sulphur content of the coal and either the H_2S content of the crude gas or the total sulphur content of the purified gas, neither is high H_2S always accompanied by high fixed sulphur.

Another point to be noted is that the degree of sulphiding of discarded oxides seldom reaches that degree, 50 to 60 per cent, so often given as a figure for best purifying performance despite the fact that all of the plants included are large ones, in which best performance would

Plant	Kind of Gas	Grains H_2S in 100 cu. ft. Crude Gas	Total Sulphur in Purified Gas	Sulphur in Discarded Oxide	Kind of Purifying Material	Revivification Method	Kind of Coal Used	Sulphur in Coal—%
A	Coke Oven	620	6.05		Rust Oxide		Crescent Pocohontas LaBelle	No analysis
B	Coke Oven	405	11.5		Borings	Out of Boxes		No analysis
C	Coke Oven	169	Mixed Gas		Bog Ore and Lux.	Out of Boxes	Jamison HV	1.1
	Water	131	8.5	37%			Davis HV	1.2
D	Horizontal Retorts	480	15.0	35%	Borings & Bog Ore	Out of Boxes	Westmoreland Federal	.9 to 1.2
E	Horizontal Retorts	257	18.6	35 to 45	Borings	Partly out of Boxes Partly "in Situ"	W. Va. 35 to 38% Volatile	0.73
	Coke Oven	132	15.9					
	Water	120						
F	Coke Oven	385	15.0	38 to 55	Natural Oxide	Out of Boxes	Fairmont 36.5% Volatile	1.00 to 1.2
G	Coke Oven	175	12.0	35 to 45	All kinds		Elkhorn	0.55
H	Coke Oven	194	Mixed	34-40	Borings	Out of Boxes	Milburn & Pocohontas	0.63
	Water	81	7.0					
I	Verticals	245	7.8		All kinds	In situ, rotating and out of Boxes	Westmoreland, Roda Pocohontas Amherst	
	Water	85	7.2					
J	Coke Oven	292	6.1	None yet Discarded	Natural & Mine Water	Rotation & Out of Boxes	Kentucky HV New River LV	.78
	Water	105	4.9					

be expected. It seems, therefore, that 50 to 60 per cent sulphur is usually an unattainable figure under conditions commonly prevailing, which might include incomplete detarring of the gas before the purifiers, labor costs too high to warrant handling oxide a sufficient number of times to obtain the highest degree of saturation with sulphur and lack of confidence in the feasibility of employing to a greater degree, revivification in place. It is interesting to note that in only three of the ten plants given in the table was revivification in place practiced. It is undoubtedly true that the method has its faults which prevents operators from taking advantage of its theoretical advantages to the degree possible.

The ends sought for in gathering data for this report, have not been entirely achieved. A further study of conditions which tend to make the sulphur in coal go over into fixed sulphur compounds would be useful. Likewise the conditions in purifiers which tend to the elimination of a part of the fixed sulphur in the purifiers, should be better understood. From the data gathered, however, it seems that with liquid or other purification methods which will permit the removal of additional amounts of H_2S from the gas cheaply, the fixed sulphur content of the finished gas will be no bar to the use of coals of considerably higher sulphur content unless the higher sulphur coals should yield a proportionately much larger amount of fixed sulphur to the gas.

* * *

The Engineering Experiment Station of the University of Illinois has recently issued Bulletin No. 133 on "A Study of Explosions of Gaseous Mixtures."

This Bulletin gives the results of a very complete investigation of tests with manufactured gas as well as a historical review of the principal researches in this subject and a bibliography on gaseous explosions. Copies may be secured by writing direct to The Engineering Experiment Station, University of Illinois, Urbana, Ill.

Technologic Paper No. 222 of the Bureau of Standards, recently issued, and entitled "Relative Usefulness of Gases of Different Heating Value and Adjustments of Burners for Changes in Heating Value and Specific Gravity," contains much valuable data. These tests, the results of which are contained therein, were run in connection with the recent investigation by the Public Service Commission of Maryland in the Baltimore case.

Capacities of Consumers' Meters

To Each Company Member:

In February you were asked to tell this Committee what meter sizes you were using, or desired to use, and the hourly capacity of each size. From your replies and from other sources of information, two facts are at once apparent. First, though text books show *eleven* sizes, as follows: 3, 5, 10, 20, 30, 45, 60, 100, 150, 200 and 300 for hourly capacities to 3500 cubic feet, present practice is to obtain this range of capacity by the use of not more than *seven* sizes. Second, that most companies follow one or the other of the two schedules below.

Screw and Case Size	Hourly Capacity Cu. Ft.	Screw and Case Size	Hourly Capacity Cu. Ft.
5	175	5	150
10	375	10	260
30	875	20	450
60	1500	30	600
150	3400	60	1200
		100	1800
		200	3500

The Peoples Gas Light and Coke Company of Chicago, being especially desirous of obtaining large capacity meters, is now using the following schedule:

Screw and Case Size	Hourly Capacity Cu. Ft.
5	150
10	260
30	600
*11	1100
*25	2500
*40	4000
*60	6000
*170	17000

*Design peculiar in Chicago.

These schedules are given here and now to focus your attention on concrete practices. Immediate criticism and comment of every kind is invited to be sent to Walton Forstall, Chairman, 1401 Arch Street, Philadelphia.

Committee on Standardization of Capacities of Consumers' Meters,

WALTON FORSTALL, *Chairman.*

(Continued from page 240.)

If it is, be assured the stove is strong and durably constructed, and incorporates sound engineering ideas of gas range construction. The American Gas Association, 342 Madison Avenue, New York City, will gladly give you a list of range makers whose product is made in accordance with their specifications, so don't hesitate to ask them if you want such a list.

Employment Bureau

SERVICES REQUIRED

WANTED—Distribution Engineer for company in rapidly growing territory. Must be thoroughly experienced on distribution work, both high and low pressure, with welded and cast iron pipes. Must be able to handle men and produce results. Company has 50,000 meters and offers a splendid opportunity for capable man. Address A. G. A. Key No. 019.

WANTED—FOREMAN for Gas Department. High pressure distribution. Experienced in running extensions, services, regulators, meters, gas appliance installations, appliance maintenance, and complaint work. Permanent position in good locality in East. 3,000 services. State age, experience, salary expected and references. Address A. G. A. Key No. 020.

WANTED—Superintendent Gas Department in an eastern gas and electric company with a send-out of approximately 25,000,000 cubic feet a year. A young technical graduate with some gas experience is preferred for this position. Address A. G. A. Key No. 021.

WANTED—A progressive New England Gas Company selling annually 200 Automatic Water Heaters requires the services of a first class water heater salesman. Must be clean cut with personality and ability to sell consumers and plumbers. A good position for a good man. Give qualifications, age, experience, references and salary desired. Address A. G. A. Key No. 012.

WANTED—Sales Engineer experienced in designing silica and fire clay Retort Benches and other furnaces. State experience and what acquaintance, if any, with the Gas Trade. Address A. G. A. Key No. 013.

WANTED—We want a man of long experience on gas main and service work, particularly high pressure, setting and adjusting regulators, etc. State age, experience and salary desired. Address A. G. A. Key No. 014.

CUSTOMER OWNERSHIP—Wanted, man experienced in customer ownership stock campaigns. Approximately 20,000 gas and electric consumers; about 90,000 population. Advise experience, salary desired, references, etc. Address A. G. A. Key No. 016.

WANTED—Chief Clerk, 10,000 gas and electric accounts; approximately 14 employees. Property is one of a large group with excellent future prospects. State age, salary desired, references, and submit full and complete details regarding experience. Address A. G. A. Key No. 017.

WANTED—A young technical graduate (about 22 to 27 years of age) for general Physical Testing and Research, by a large eastern gas company. Must have a good knowledge of general physics, particularly electrical measurements, and some gas works' experience. Should be able to plan and execute tests and research work, and prepare comprehensive reports thereon. An exclusively chemically educated man not wanted. Give full particulars in the first letter. Address A. G. A. Key No. 015.

WANTED by a gas and electric company, young man to do office work who has had experience in ledger work, general routine work and especially on the complaint or service desk. In reply, please give outline of experience, references and salary expected. Address: Key No. 022.

WANTED—Gasfitter competent to handle all kinds of gas fitting and complaint work with small gas company. Must have had several years' experience with reliable gas companies. Address Key No. 023.

A GAS COMPANY situated in a medium sized semi-foreign city desires a live Commercial Manager. Must be familiar with domestic and industrial appliances and competent to handle a New Business Department. In reply, please state age, education, languages spoken other than English, if any, whether married, experience and references. Address: A. G. A. Key No. 024.

WANTED—Two Industrial Gas Salesmen for middle west city having an attractive gas rate. State experience, salary wanted. Address A. G. A. Key No. 011.

SERVICES OFFERED

WANTED—Position by a man of large general experience in gas business who has made a special study of sales promotion problems, and who would prove valuable as an assistant to a busy executive in any department. Address A. G. A. Key No. 134.

WANTED—Position of responsibility as Manager or Industrial Fuel Engineer—18 years varied experience in the gas business. References and service record furnished. Address A. G. A. Key No. 142.

POSITION WANTED—By-Product, Coke-Oven Executive seeks more responsible connection. Fitted for Chief Chemical Engineer, Assistant-Superintendent or Assistant to Manager. University Graduate. Alexander Hamilton Institute Graduate. Nearly seven years with present 3000 ton plant. Thirty-two years old. Married. Address A. G. A. Key No. 151.

POSITION WANTED as superintendent of small gas company or as general foreman of large plant. Approximately seventeen years' experience in all branches of manufacture and distribution, high and low pressure systems. Address A. G. A. Key No. 152.

YOUNG MAN 27 years of age, seven years' experience with president of combination gas, electric, and street railway property, town of 40,000 people, desires new connection. Thoroughly experienced in the handling of correspondence and the compilation of financial, statistical and operating reports and statements, as well as the general work in connection with public utility corporations. Address A. G. A. Key No. 153.

COMMERCIAL MANAGER OR GAS APPLIANCE SALESMAN—Seven years' experience in all commercial departments of Eastern coal gas company. Five years' experience in selling domestic and industrial gas appliances. Willing to work in office or outside selling. Experienced in handling personnel of the departments. Address A. G. A. Key No. 154.

WANTED—Gas Engineer, experienced in coal and water gas production, with large experience in experimental work, would like a position as supervisory engineer of a large plant or chain of plants or a position as experimental engineer. Capable of carrying on large tests on a practical operating scale and of getting results. Specialist in the use of bituminous coal in water gas production. Has been an active member of several A. G. A. technical committees. Author of several reports and publications on gas technical subjects. Graduate in Chemical Engineering from a large middle western university. Age 38, married. Now employed. Address A. G. A. Key No. 149.

WANTED—Am open for a position of greater responsibility. At present manager of gas company in city of over 5000 gas consumers. Experience consists of four years as manager and eleven years in operating, construction and distribution. Age 39, married. Address A. G. A. Key No. 157.

WANTED—Plant or General Superintendent position wanted by married man, who has grown up in the gas business, and worked through the manufacturing and distribution departments to General Superintendent of plant of 1,000,000 cubic feet per day capacity. Thirteen years with last company. Coal and water gas manufacture and high and low pressure distribution. College graduate. Address A. G. A. Key No. 155.

WANTED—Experienced gas man would connect with a going company in managerial capacity. Can report with reasonable notice. No choice as to location. Address A. G. A. Key No. 156.

WANTED—Position as manager of small gas plant (about 10,000 meters) or sales manager of larger plant. Can furnish the very best reference. Key No. 158.

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